SONY

FM Stereo/FM-AM Receiver

Operating Instructions

STR-D2090
STR-D1090

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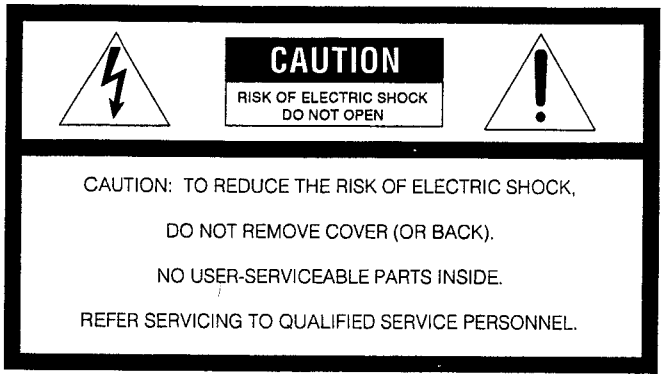
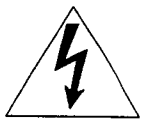
Warning

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Owner's Record

The model number is located on the rear exterior and serial number is on the rear. Record the serial number in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No._____ Serial No._____

Note to CATV system installer
This reminder is provided to call the CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

INFORMATION
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

— Reorient or relocate the receiving antenna.
— Increase the separation between the equipment and receiver.
— Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
— Consult the dealer or an experienced radio/TV technician for help.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

For the customers in Canada

CAUTION :
TO PREVENT ELECTRIC SHOCK, DO NOT USE THIS POLARIZED AC PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

This apparatus complies with the Class B limits for radio noise emissions set out in Radio Interference Regulations.

CAUTION
Use of this appliance with some systems may present a shock or fire hazard. Do not use with any units which have the following marking located near output, WARNING: HAZARDOUS ENERGY !.

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Introduction

Overview

The STR-D2090/D1090 is an FM Stereo/FM-AM receiver and audio/video control center.
You can enjoy various audio/video program sources with this unit.

TV/video programs
- You can enjoy TV or CATV programs with FM simulcast.
- Sounds from various audio program sources can be added on video tapes during editing.

Tuner
- Precise tuning is ensured by a quartz lock digital synthesizer.
- Station Index system allows you to tune into a station quickly.

Powerful surround sound
By connecting the power amplifier to the SURROUND OUT jacks of this unit, you can obtain powerful surround sound.

Digital surround processor
- The STR-D2090/D1090 electronically reproduces the reflected sound (early reflection) and reverberation sound (reverberation) by using its digital signal processor, and allows you to obtain the acoustics of various situations.
- **DOLBY PRO LOGIC**: The STR-D2090 and STR-D1090 incorporate the Dolby Pro Logic Surround Decoder which has the same functions for playback as movie theaters and gives a theater-like experience in your listening room, naturally reproducing the audio sound field.

* Manufactured under license from Dolby Laboratories Licensing Corporation. Additionally licensed under one or more of the following patents: U.S. numbers 3,632,886, 3,746,792, and 3,959,590. Canadian numbers 1,004,603 and 1,037,877. "DOLBY" and the double-D symbol ⊡⊡ are trademarks of Dolby Laboratories Licensing Corporation.

Digital parametric equalizer
You can enjoy audio program sources with appropriate equalization curve by controlling the level of the desired 3 frequency bands.

Sound field
- 10 recommended sound field programs (combination of surround and parametric equalizer settings) are preset in the factory for easy use. You can also store up to 10 settings you created in the memory.
- Combined use of the sound field programs and the preset stations allow you to enjoy broadcast listening immediately with the memorized sound field settings.

ON SCREEN function (STR-D2090 only)
This function allows you to monitor the operation being performed on the monitor TV.

TITLE function (STR-D2090 only)
With this function, you can edit a title and superimpose on your picture.

Remote commander supplied
The STR-D1090 is supplied with the RM-U221. The STR-D2090 is supplied with the RM-P321 which can "learn" the various functions of other remote commanders of the infrared type.

The FUNCTION/SOUND FIELD/PRESET TUNING buttons
There are two kinds of modes for the FUNCTION/SOUND FIELD/PRESET TUNING buttons. One is the "Auto mode" and the other is the "Manual mode". With these modes, you can conveniently operate this receiver.
This manual describes the operations in the auto mode.

Precautions

On safety
- Operate the unit only on 120 V AC, 60 Hz.
- Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Unplug the unit from the wall outlet if it is not to be used for an extended period of time. To disconnect the cord, pull it out by grasping the plug. Never pull the cord itself.
- One blade of the plug is wider than the other for the purpose of safety and will fit into the power outlet only one way. If you are unable to insert the plug fully into the outlet, contact your dealer.

On operation
Before making program source connections, be sure to turn the power switch off and unplug the unit.

On cleaning the cabinet
Clean the cabinet, panel and controls with a soft cloth lightly moistened with mild detergent solution. Do not use any type of abrasive pad, scouring powder, or solvent such as alcohol or benzine.

For the customers in the U.S.A.
For detailed safety precautions, see the "IMPORTANT SAFEGUARDS" leaflet.

If you have any question or problem concerning your unit, please consult your nearest Sony dealer.

Unpacking

Choosing a Good Location

To prevent internal heat buildup in the unit,
place the unit in a location with adequate air circulation.

Do not install the unit:
- near heat sources such as radiators or air ducts.
- in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.

Do not place anything on top of the cabinet.
The top ventilation holes must be unobstructed for the proper operation of the unit and to prolong the life of its components.

Do not throw away the carton and packing material!
It will be an ideal container when transporting the system for repair work, etc.

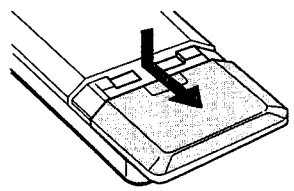
Checking the Supplied Accessories

After unpacking, check that the following accessories are present.
- FM wire antenna ..... (1)
- AM loop antenna ..... (1)
- Remote commander RM-P321 (supplied with STR-D2090) ..... (1)
- Remote commander RM-U221 (supplied with STR-D1090) ..... (1)
- Sony batteries SUM-3 (NS) ..... (2)

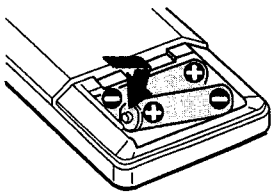
Inserting the Batteries into the Remote Commander

Before operating remote commander, install the batteries as shown.

1 Open the cover.



2 Two size AA (R6) batteries with correct polarity.



To avoid damage caused by battery leakage and corrosion
When the commander will not be used for a long time, remove the batteries.

Battery life
Normal operation can be expected about a half year using Sony SUM-3 (NS), and a year using Sony AM-3 (NW) alkaline batteries.
When the batteries are run down, the remote commander will not operate the unit. In this case, replace batteries with new ones.

Selecting the AM Tuning Interval

The AM tuning interval is preset to 10 kHz. To use the receiver where the frequency allocation system is based on a 9 kHz interval, make the following adjustments.

1 Turn on the power and tune in any AM station.
2 Turn off the power.
3 Press the POWER button while pressing the "+" INDEX SELECT/TUNING button.
To reset the AM tuning interval, repeat the above steps.

Caution
When the interval is changed, all preset stations which you have memorized will be erased. After changing the interval, be sure to preset the stations again.

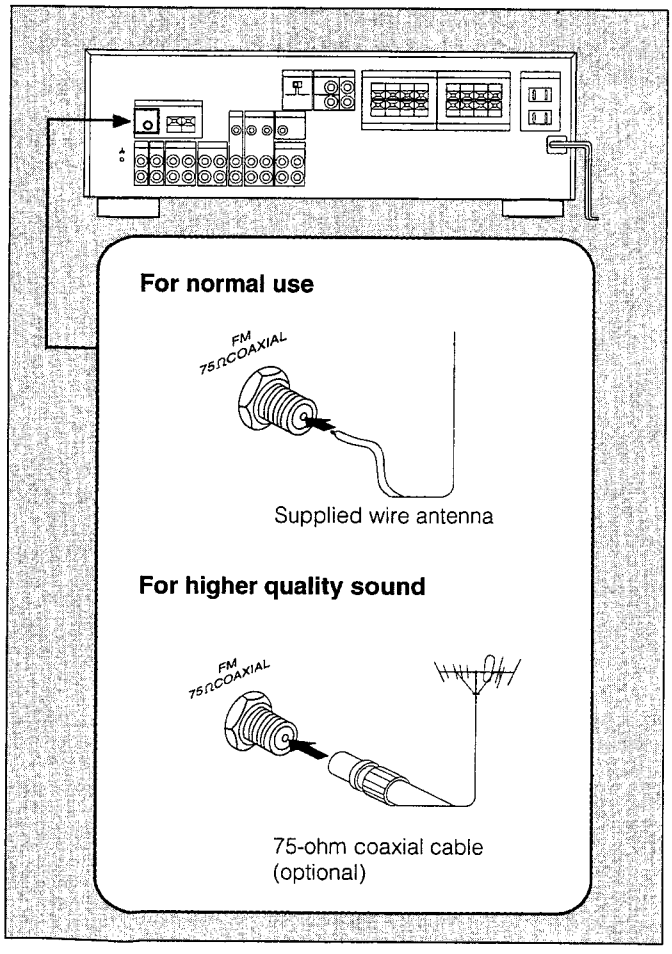
Hooking Up the System

At first, this section describes about the antenna connection and then the connection with the other equipment. After that, it shows about the speaker connection and about the AC outlet.
The STR-D2090 has the AMP MODE selector and the SURROUND OUT jacks on the rear panel. The illustrations described on the connections are the STR-D2090.

- Do not connect the power cord to an AC outlet nor press the POWER switch before accomplishing all other connections.
- The cable connectors should be fully inserted into the jacks. Loose connection may cause hum and noise.
- Jacks and plugs of the connecting cord are color-coded as follows:
  Red jacks and plugs: For the right channel of audio signals
  White jacks and plugs: For the left channel of audio signals
  Yellow jacks and plugs: For video signals

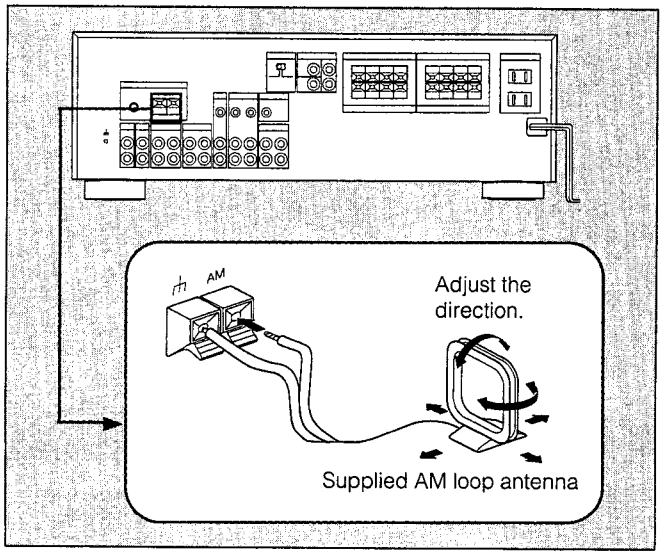
Connecting an FM Antenna

Though the wire antenna is supplied with this unit, the higher quality sound will be obtained with the 75-ohm coaxial cable.



Connecting an AM Antenna

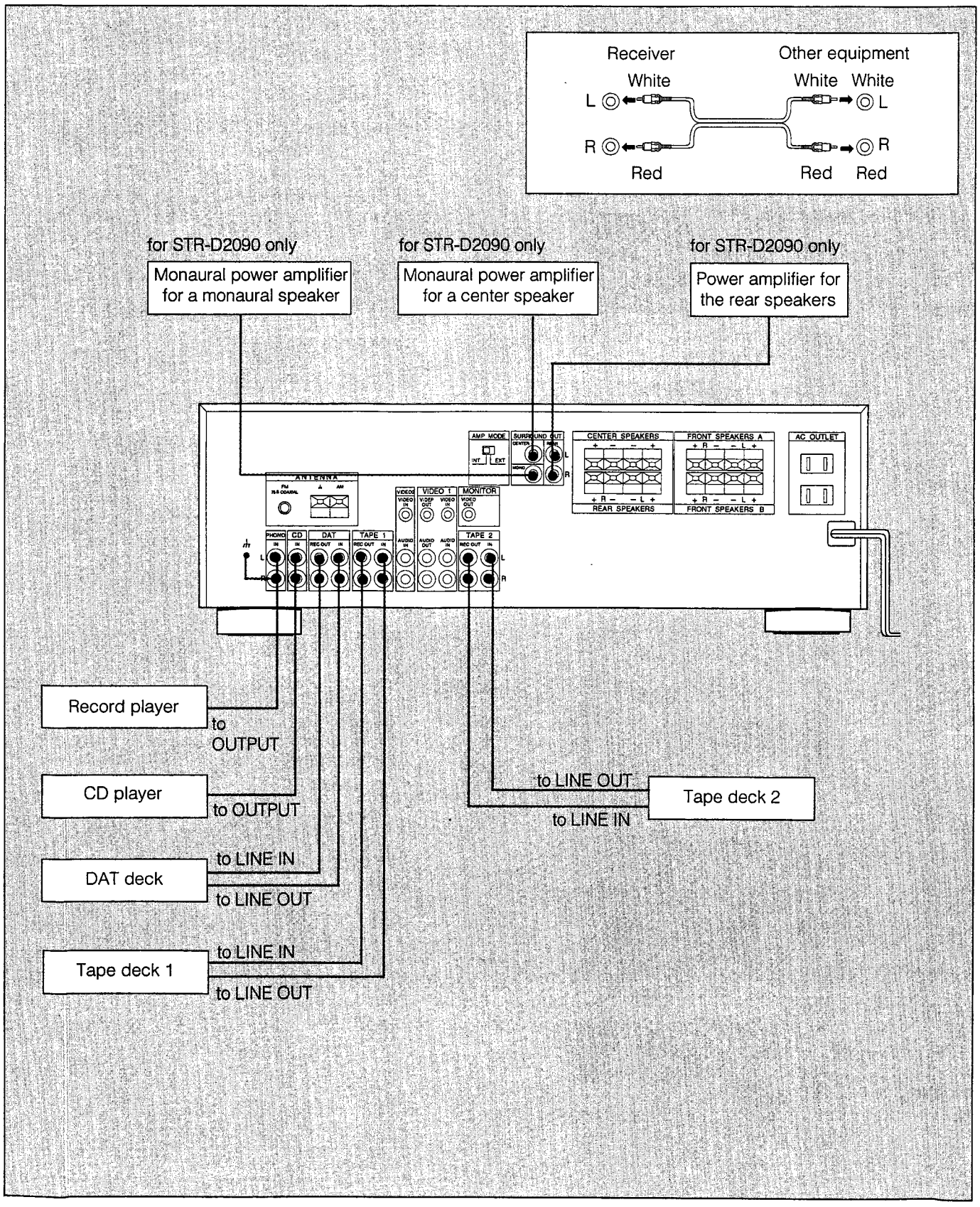
The AM broadcast is enough received with the supplied AM loop antenna. However, the connection of insulated wire is also available for areas with difficult AM reception.



For areas with difficult AM reception
In areas with troubled reception, connect a 6 to 15-meter (20 to 50-feet) insulated wire to the AM antenna terminal. Extend this out of doors if possible, keeping the greater portion horizontal.
(There is no need to disconnect the supplied antenna.)

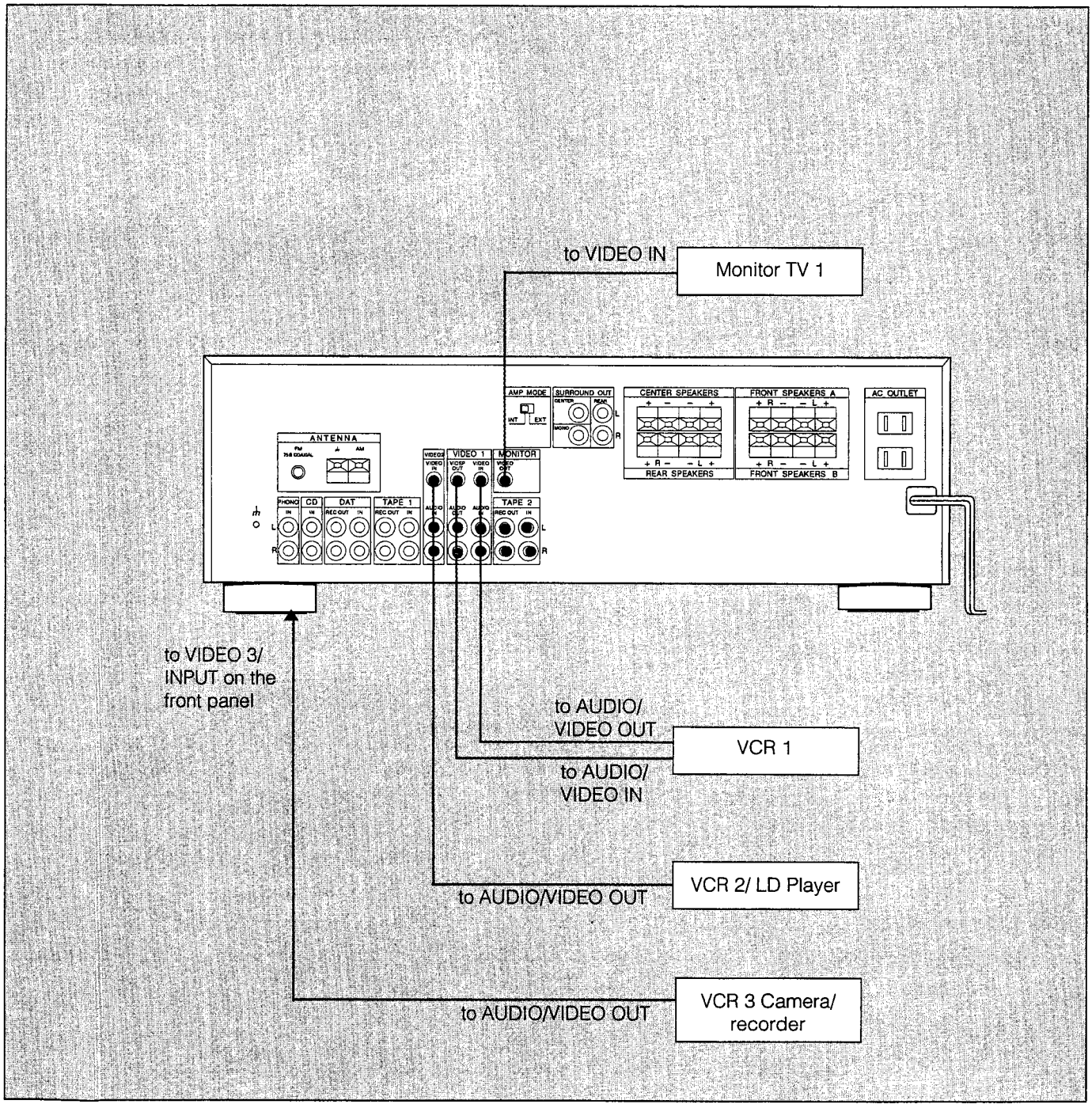
To prevent hum
Connect the ground wire to ANTENNA ground terminal (⏚). When an outdoor antenna is installed, be sure to connect the ground wire for lightning protection.

Connecting Audio Equipment



Hooking Up the System

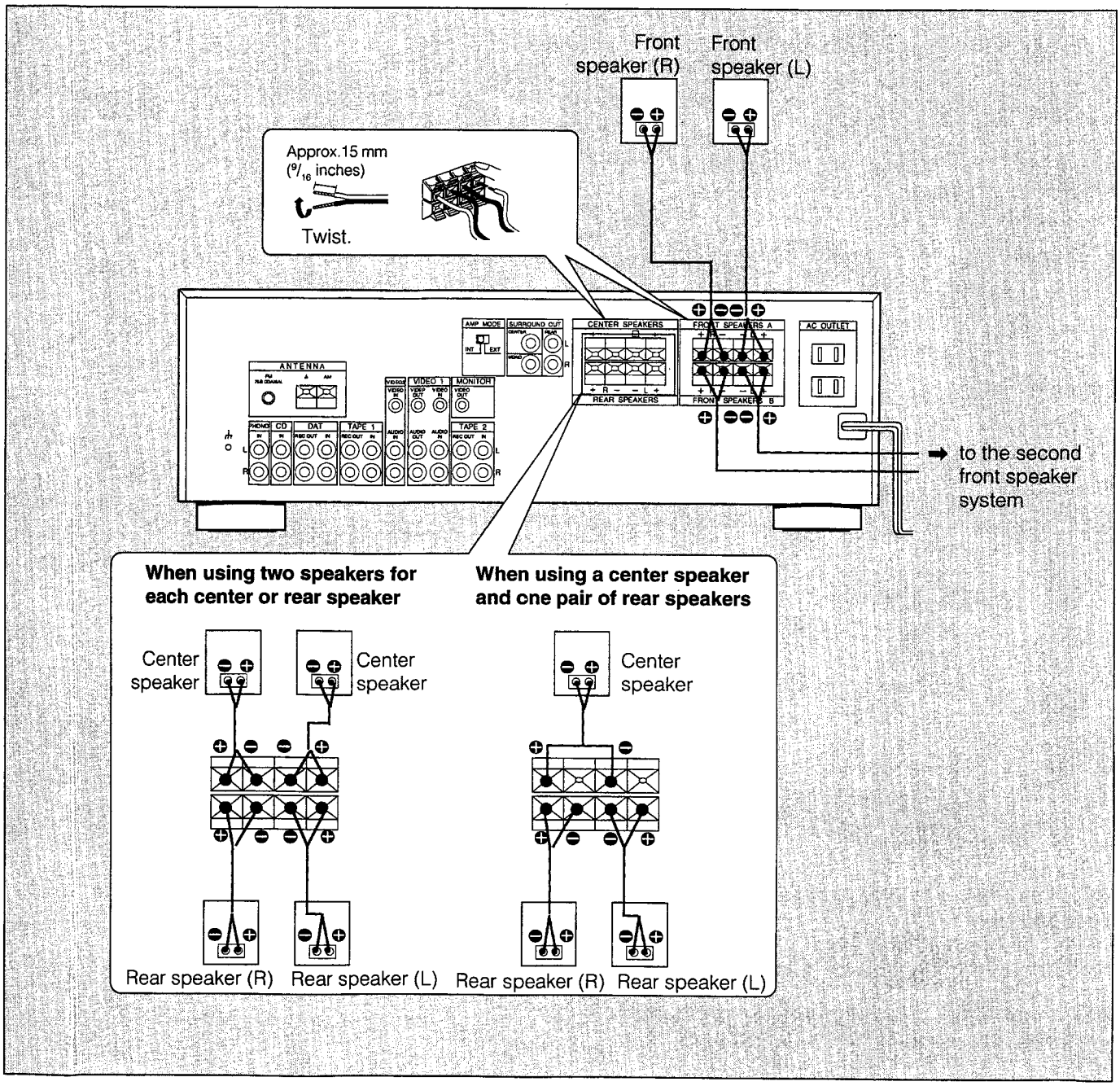
Connecting Video Equipment



Caution for STR-D2090
When the MONITOR VIDEO OUT jack is connected and ON SCREEN ON/OFF is set to ON, the cursor mode operation buttons cannot be used for the other functions than the ON SCREEN function.

Connecting Speaker Systems

Front, rear and center speakers can be connected to this unit.



Speaker impedance and power capability

This receiver is designed to work best with speakers having nominal impedance from 8 to 16 ohms. Be sure to use a speaker system with adequate nominal impedance and power handling capabilities.

When using two center speakers, use the speakers having nominal impedance from 4 to 16 ohms.

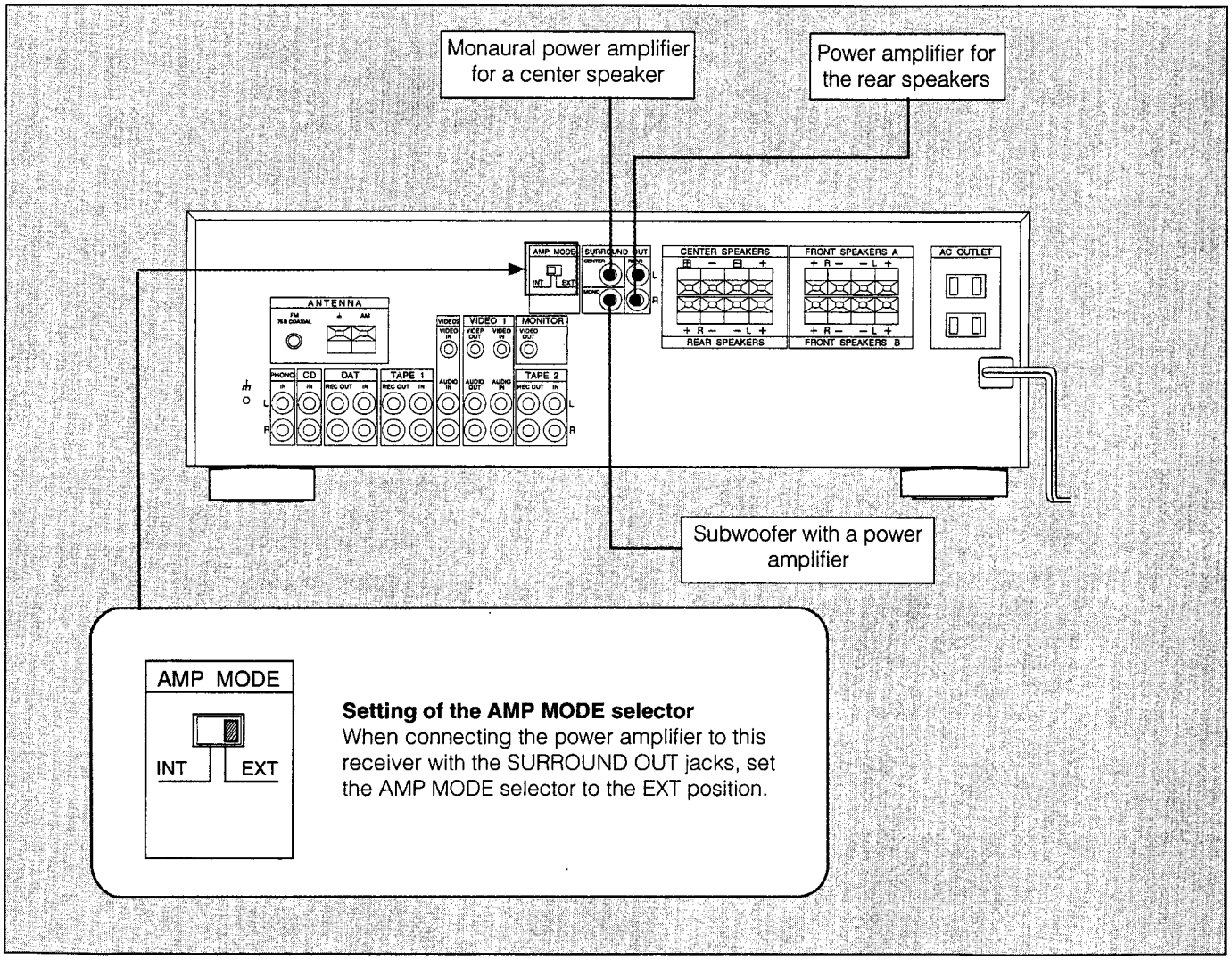
Note

- When connecting the speaker cord to the speaker terminal, make sure that the polarity (+ and –) of the speaker cord is correct. If the polarity is reversed at either speaker, the sound will be distorted and will lack bass.

Hooking Up the System

Connecting the external power amplifier (for STR-D2090 only)

By connecting the external power amplifier to this receiver, you can obtain a powerful sound.


Monaural power amplifier for a center speaker
Power amplifier for the rear speakers
Subwoofer with a power amplifier
AMP MODE
INT
EXT
Setting of the AMP MODE selector
When connecting the power amplifier to this receiver with the SURROUND OUT jacks, set the AMP MODE selector to the EXT position.

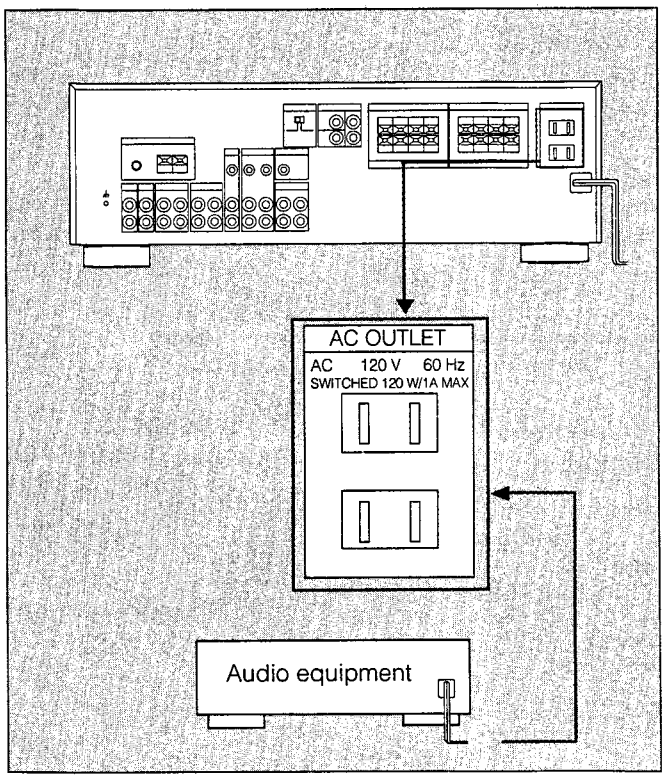
When connecting a monaural power amplifier for a center speaker
Connect the input jack of the power amplifier to the SURROUND CENTER jack of this receiver.

When connecting a subwoofer with a power amplifier
Connect the line input jack of the subwoofer to the SURROUND MONO jack of this receiver.
When using subwoofer not having a power amplifier, connect through a monaural power amplifier.

When connecting a power amplifier for the rear speakers
Connect the input jacks of the power amplifier to the SURROUND OUT REAR jacks of this receiver.

Connecting to the Power Outlet

By connecting the power cord of the other audio equipment to SWITCHED AC OUTLET, this unit can supply the power source to the other audio equipment.



Caution
Be careful that the total power consumption of each equipment connected to the outlets on the receiver does not exceed 120 watts.
Do not connect electrical home appliances such as an electric iron, fan, TV, or other high-wattage equipment to these outlets.

Selecting the Mode of the FUNCTION/SOUND FIELD/PRESET TUNING Buttons

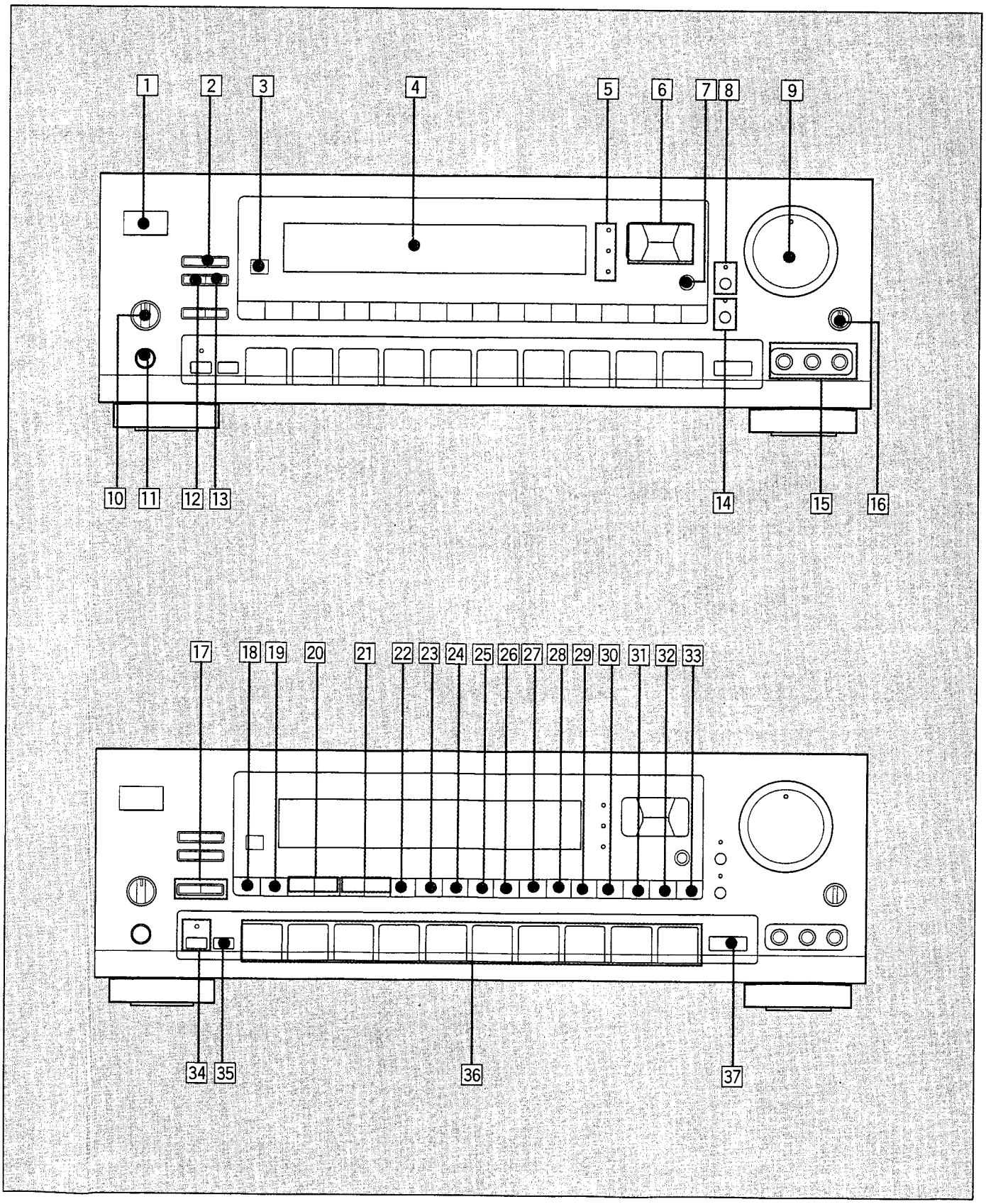
There are two kinds of modes for the FUNCTION/SOUND FIELD/PRESET TUNING buttons. One is the "Auto mode" and the other is the "Manual mode".

- **Auto mode**
  The FUNCTION/SOUND FIELD/PRESET TUNING buttons are factory preset to the auto mode.
  After one of the FUNCTION buttons, SOUND FIELD LINK, SOUND FIELD ON/OFF or SOUND FIELD USER/PRESET is pressed, the FUNCTION/SOUND FIELD/PRESET TUNING buttons change to the SOUND FIELD mode automatically.
  When TUNER is pressed, these buttons function as numeric buttons.

- **Manual mode**
  When you press the POWER switch while pressing MODE SELECT, the FUNCTION/SOUND FIELD/PRESET TUNING buttons are set to the manual mode.
  With MODE SELECT, you can select the desired mode.
  To return to the auto mode, perform the same procedure again.

Parts Identification

Front Panel



[1] **POWER switch**

[2] **ON SCREEN ON/OFF button** (STR-D2090 only)

[3] **Remote sensor**

[4] **Display window**

[5] **CURSOR MODE indicators**
(See pages 18, 23, 32, 33, 35, 38.)

[6] **Cursor mode operation buttons**
(See pages 8, 18, 23, 32, 33, 35, 38, 40)

[7] **CURSOR MODE/TITLE MENU button**
(TITLE MENU button: STR-D2090 only)
(See pages 18, 23, 32, 33, 35, 38, 40.)

[8] **DBFB button and indicator** (See page 16.)

[9] **MASTER VOLUME control** (See page 16.)

[10] **SPEAKERS selector** (See page 16.)

[11] **HEADPHONES jack**

[12] **TITLE ON/OFF button** (STR-D2090 only)
(See pages 40, 41.)

[13] **TITLE IN/OUT button** (STR-D2090 only)
(See page 41.)

[14] **MUTING button and indicator** (See page 16.)

[15] **VIDEO 3/INPUT jacks**

[16] **BALANCE control** (See page 16.)

[17] **EDIT VIDEO/AUDIO buttons** (See pages 27, 28.)

[18] **DISPLAY GRAPHIC button** (See page 38.)

[19] **DISPLAY INDEX button** (See pages 20, 24.)

[20] **INDEX SELECT/TUNING –/+ buttons**
(See pages 20, 24.)

[21] **PRESET TUNING –/+ buttons** (See pages 22, 24.)

[22] **TUNING LEVEL button** (See page 20.)

[23] **MEMORY button** (See pages 18, 21, 23.)

[24] **DIRECT TUNING button** (See page 19.)

[25] **FM MODE button** (See page 19.)

[26] **FM/AM button** (See pages 19, 20.)

[27] **SOUND FIELD LINK button** (See page 39.)

[28] **SOUND FIELD ON/OFF button** (See pages 32, 33.)

[29] **SOUND FIELD USER/PRESET button**
(See pages 35, 38, 39.)

[30] **Dolby PRO LOGIC MODE button**
(See pages 31, 32.)

[31] **EQUALIZER FLAT button** (See page 38.)

[32] **EQUALIZER SLOPE button** (See page 38.)

[33] **EQUALIZER BAND button** (See page 38.)

[34] **TAPE 2 MONITOR button and indicator**
(See page 26.)

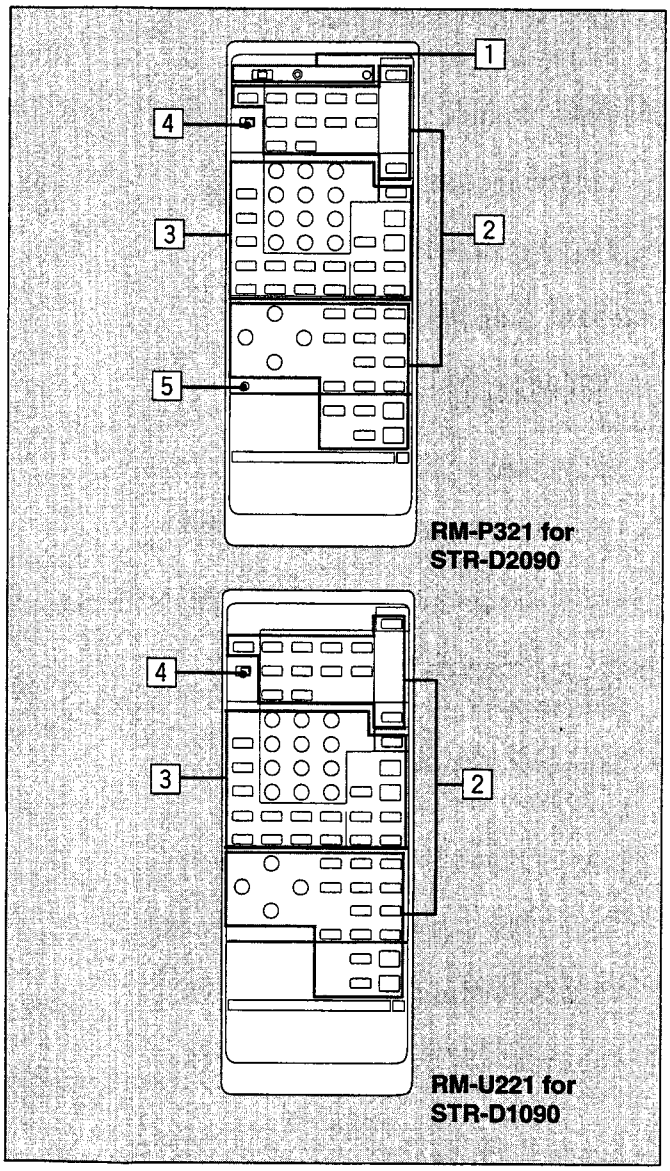
[35] **SHIFT button** (See pages 21, 22, 23.)

[36] **FUNCTION/SOUND FIELD/PRESET TUNING buttons**
(See page 11.)

[37] **MODE SELECT button**

Parts Identification

Remote Commander



1 Program control section (RM-P321 only)

Mode selector and indicator
SONY STD: To control Sony equipment.
USER STD: To control equipment whose remote control functions are stored.
LEARN: To store functions of other remote commanders emitting infrared rays.
PROGRAM CLEAR: Clears the stored functions.

2 Receiver control section

FUNCTION:
DAT, CD, TUNER, PHONO, VIDEO 1, VIDEO 2, VIDEO 3, TAPE, DIGITAL 1, 2: The each function is selected and the each unit enters its operating mode automatically. (DIGITAL 1 and 2 do not function.)
SYSTEM OFF: Turns off the power of the whole system.
POWER: Turns on the power of the receiver.
SOUND FIELD buttons
U/P (user/preset): Selects the USER or PRESET mode.
MODE: Selects the sound field mode.
ON/OFF: Turns on/off the sound field system.
BAND: Selects the frequency band of the equalizer.
EQ: Turns on/off the setting of TONE controls.
T. (test) TONE: Generates a pink noise signal that is sent in succession to each speaker.
CURSOR MODE: Select CURSOR MODE.
CURSOR operating buttons
REAR LEVEL +/– buttons: Control the volume of rear speakers (surround level).
CENTER LEVEL +/– buttons : Control the volume of center speaker (surround level).
DBFB button: Turns on/off the DBFB (Dynamic Bass Feedback).
MUTING button: Mutes the sound.
MASTER VOL +/– buttons: Control the receiver volume.
SLEEP: Set to the SLEEP timer mode. In this mode, the unit is automatically turned off after the designated time.
ON SCREEN ON/OFF button: Turn on/off the ON SCREEN mode. (RM-P321 only)

3 Other equipment control section

Numeric buttons (1 to 0): Designate the number.
ENTER: Press after designating the TV/VCR channel.
SHIFT: Select the memory page (A, B or C).
TV/VIDEO selector: Selects the program to see : TV or VIDEO.
ANT TV/VTR button: Selects the output signal from the antenna terminal on the VCR, either a TV signal or VCR programs.
CH/PRESET +/– buttons: Select a preset channel.
INDEX: Set to the index tuning mode.
◄◄/►►: Fast winding/manual search
●: Recording
◄/►: Play
■: Stop
II: Pause
I◄◄/►►I: Locates a desired selection.
REV/FWD: Press ● and REV or FWD at the same time.
D (disc) SKIP: Disc skip (for a CD player equipped with a multi-disc changer)
SELECT: Changes the settings of the FUNCTION buttons.

Note

The button which has no name does not function.

4 SYSTEM/TV mode switch

In TV mode (When setting the SYSTEM/TV selector to TV)

Only MUTING, MASTER VOL +/– and the operative buttons in TV section on the list described on the next page can be used.

5 RESET button

Resets the remote commander to the initial state.

Operating with the Remote Commander

Before operating the equipments with the remote commander, be sure to set the receiver to the desired mode by pressing one of the FUNCTION buttons.

The FUNCTION buttons are factory set in the following list.

FUNCTION to be pressed	Operating equipment
DAT	DAT
CD	CD player
TUNER	Tuner
PHONO	(The receiver enters the PHONO mode.)
VIDEO 1	Betamax VCRs (VCR 1)
VIDEO 2	LD player
VIDEO 3	8 mm VCRs (VCR 2)
TAPE	Tape deck A

- When VIDEO 1, 2 or 3 is pressed, the power of the selected video equipment and TV is turned on.

Operating the equipment

1 Press the desired FUNCTION.
2 Press ◄ (only for tape deck) or ► to start playback.

Changing the Settings of the FUNCTION Buttons

With the SELECT button, you can replace the functions stored in the FUNCTION buttons.

To change the settings of the FUNCTION buttons

1 Press one of the FUNCTION buttons to be stored.
2 Press SELECT.
3 Press the 1 to 9 button to select the desired function within 30 seconds.
4 Press ENTER.

To operate other unit temporarily without changing the settings of FUNCTION

1 Press SELECT.
2 Press the 1 to 9 button to select the function.
3 Press the desired button.
After operating the unit, the receiver enters the previous mode.
Operative buttons: POWER, ◄◄/►►, I◄◄/►►I, ■, ◄/►, II, ●REC, D.SKIP, TV/VIDEO, ANT TV/VTR, CH/PRESET +/–, SHIFT, INDEX.

Example:

To record the program source on DECK A in the CD mode
1 Press SELECT.
2 Press 3 (DECK A).
3 While pressing ●, press REV or FWD.
After operating DECK A, the receiver enters the CD mode automatically.

List of operative buttons in SYSTEM mode (When setting the SYSTEM/TV selector to SYSTEM

Operating equipment	TUNER	CD	DAT	DECK A, B	TV	LDP	VTR 1, 2, 3
1	•	•	•	—	•	•	•
2	•	•	•	—	•	•	•
3	•	•	•	—	•	•	•
4	•	•	•	—	•	•	•
5	•	•	•	—	•	•	•
6	•	•	•	—	•	•	•
7	•	•	•	—	•	•	•
8	•	•	•	—	•	•	•
9	•	•	•	—	•	•	•
0	•	—	—	—	•	•	•
ENTER	—	—	—	—	•	—	•
SHIFT	•	—	—	—	—	—	—
TV/VIDEO	—	—	—	—	•	*	*
ANT TV/ VTR	—	—	—	—	—	—	•
CH PRESET +/–	•	—	—	—	•	—	•
INDEX	•	—	—	—	—	—	—
D.SKIP	—	•	—	—	—	—	—
►►	—	•	•	•	—	•	•
◄◄	—	•	•	•	—	•	•
►►I	—	•	•	—	—	•	—
I◄◄	—	•	•	—	—	•	—
REV or ◄ + ●	—	—	—	•	—	—	—
FWD or ► + ●	—	—	•	•	—	—	•
II	—	•	•	•	—	•	•
◄	—	—	—	•	—	—	—
►	—	•	•	•	—	•	•
■	—	•	•	•	—	•	•

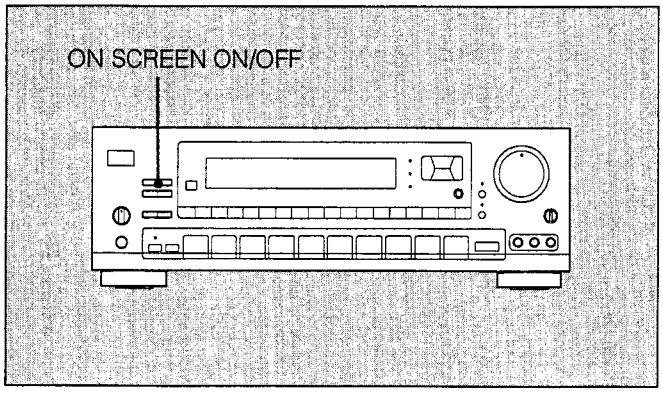
•: The button is operative.
—: The button is not operative.
* : The button can operate TV and VTR connected to TV.

Note

To operate the unit correctly, the function mode of the receiver should be same with that of the remote commander. So, be sure to press the desired FUNCTION button at first and then the operative button.

The On-Screen-Display of the STR-D2090

The STR-D2090 has the on-screen-display function. When ON SCREEN of this receiver is set to on, the information concerning with the operation you will perform appears on TV monitor screen connected to the receiver.



The on-screen-display function is available in the following modes:

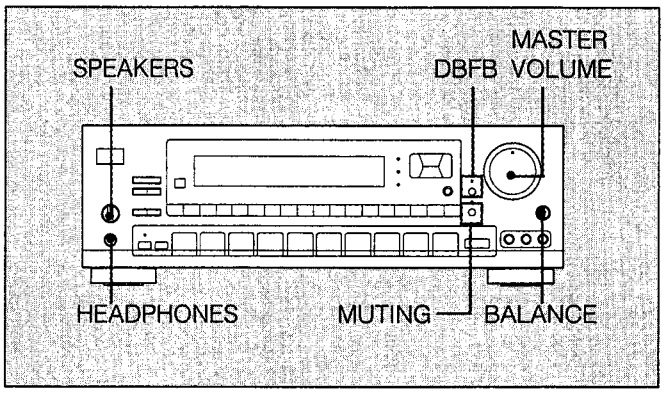
— Opening screen
— Selecting a function
— Tuner operation
— Sound field function
— Parameter adjustment of the surround effect

When the each operation is finished, the screen returns to the opening screen.

To stop the on-screen-display function
Press ON SCREEN.

Adjusting Basic Audio Controls

You can enjoy superb sounds using the audio adjustment functions as shown below.



Adjusting Volume

To adjust volume
Turn MASTER VOLUME.

To reduce the sound to a low level temporarily (– 20 dB attenuation)
Press MUTING. The indicator lights up.
Press again to restore the same listening level as before.

Adjusting Left and Right Sound Balance

Adjust BALANCE to correct stereo imaging, when the speaker position is not symmetrical.

Reinforcing the Bass

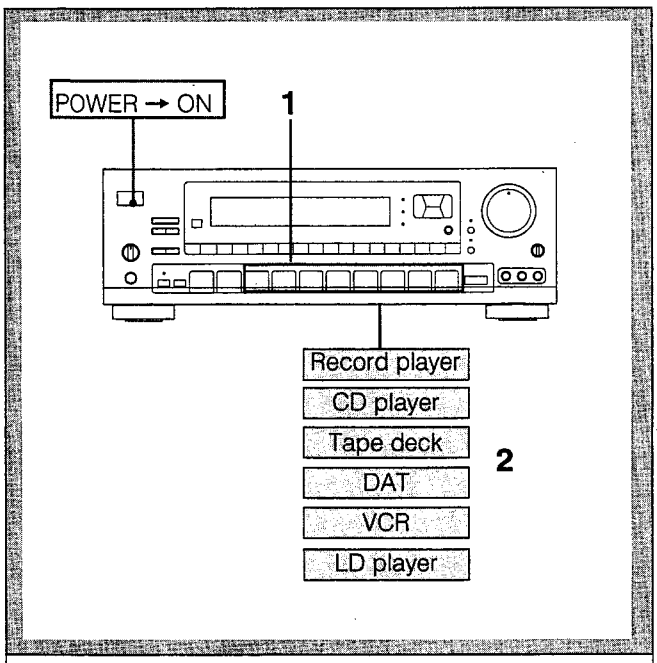
Press DBFB (Dynamic Bass Feedback) so that the DBFB indicator lights up. Press again to turn off the effect so that the indicator goes off.

Selecting the Speaker System

To drive speaker system A: Set SPEAKERS to A.
To drive speaker system B: Set SPEAKERS to B.
To drive both speaker systems A and B (series connection): Set SPEAKERS to A + B.
For headphone listening: Connect headphones to HEADPHONES and set SPEAKERS to OFF.

IMPORTANT
Speaker systems A and B are series connected. When only one speaker system is connected, no sound can be heard at the A + B position.

Selecting a Program Source



1 Select the progam source.

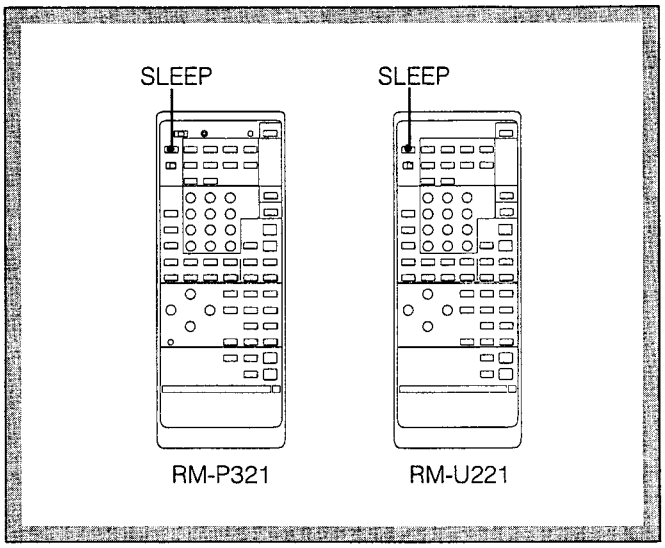
What you select	Pressed
Phono record	PHONO
Radio Broadcast	TUNER
Compact disc	CD
DAT program	DAT
Taped program	TAPE 1, TAPE 2 MONITOR
Video program	VIDEO 1, VIDEO 2/LD, VIDEO 3

When a FUNCTION button is pressed, the indicator of the function you have selected appears on the display. Select the function with the remote commander, the power switches of both this receiver and the selected equipment are turned on.

2 Start playback of the selected program.

To Turn Off the Power at the Desired Time (The Sleep Timer Function)

This receiver has the sleep timer function. With this function, you can turn off the power automatically at the desired time by designating the turn-off time.
Press SLEEP on the remote commander when the power is on. Each time SLEEP is pressed, the designating time is displayed in the following order: 2 hours → 1 hour and 30 minutes → 1 hour → 30 minutes → SLEEP OFF.



To change the turn-off time

1 Press SLEEP and the remaining time is displayed.
2 Press △ or ▽ to change the sleep time. The sleep time is changed by 1 minute. It can be changed up to 6 hours and 00 minute (and 00 second).

To check the remaining time of the sleep timer

Press SLEEP. The remaining time is displayed.

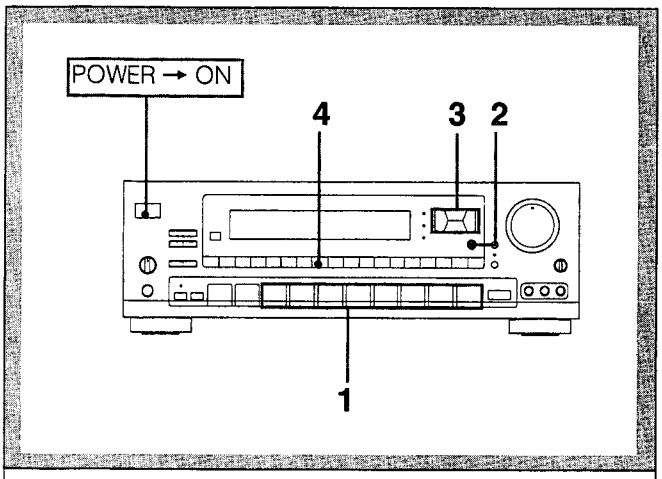
Note

When the remaining time display returns to the function display in the window, the function display is dimly lit.

Selecting a Program Source

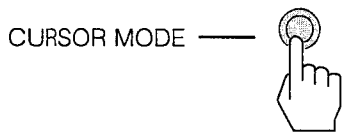
Labeling the Program Source

You can input program sources except TUNER under index names you create (up to 9 characters); for example, PHONO, CD etc.



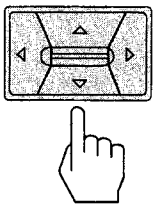
1 Select the program source with the FUNCTION buttons.

2 Press CURSOR MODE to select the INDEX mode.



The INDEX indicator lights up.

3 Create an index name.



To select a letter, press △ or ▽.
To change the position, press ◁ or ▷.

- When pressing a FUNCTION button to be named, the same function name as the FUNCTION button is displayed.

4 Press MEMORY.

The MEMORY indicator appears on the display and goes off when the memory is finished.

5 Repeat steps 1 to 4 for all other program sources you want to assign an index name to.

If you input an already stored source under any other index name

Only the last selected index name will be valid. Each program source can be stored under only one index name.

To clear the index name

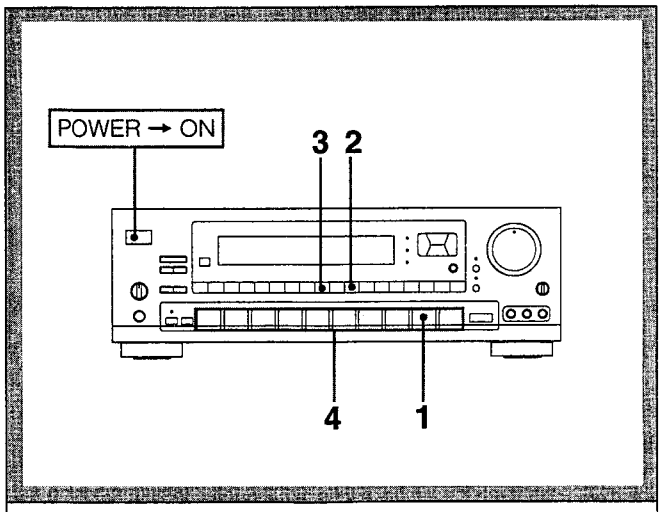
Turn off the POWER switch or select another program source.

Usable letters and symbols

(space)!→#←%&'( )*+,–./0123456789:;<=>?↑ABCDE FGHIJKLMNOPQRSTUVWXYZ[\]II_↓abcdefghijklm nopqrstuvwxyz

Receiving Broadcasts

Tuning in a Station Directly (Direct Tuning)

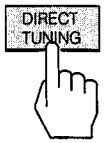


1 Press TUNER.

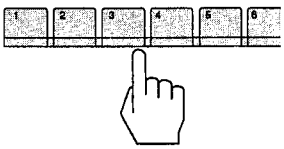
Frequency or the station index name you created is displayed.
The FUNCTION buttons change to the numeric buttons.

2 Select FM or AM.

3 Press DIRECT TUNING.

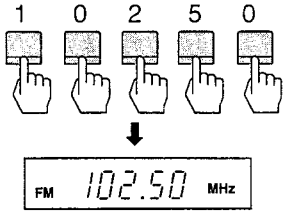


4 Enter the frequency with the numeric buttons.

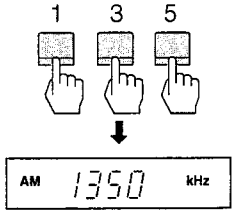


The entered frequency is displayed.

Example 1: FM 102.50 MHz



Example 2: AM 1350 kHz



To correct the entered frequency
Repeat steps 3 to 4.

For entering AM frequencies
You need not enter the last "0".
However, if you have changed the AM tuning interval to 9 kHz, enter all the digits.

If you enter a frequency not covered by the tuning interval
The entered value is automatically rounded up or down to the closest value covered by the tuning interval.
Tuning intervals for direct tuning are the followings:
FM: 50 kHz interval
AM: 10 kHz interval (changeable to the 9 kHz interval)
(See page 5)

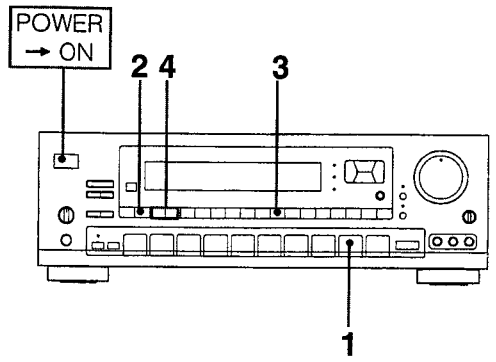
When the entered frequency does not exist in the receivable frequency range
The entered digits (up to 5 digits for FM or up to 3 digits for AM) blink in the frequency display area, and reception does not take place.
If this occurs, press TUNING DIRECT again, and enter the correct frequency (the frequency range of the receiver is 87.50 to 108.0 MHz for FM, and 530 to 1710 kHz for AM).

When an FM stereo program is noisy
When the unit receives an FM stereo program, the STEREO indicator lights in the display window. If the stereo program is noisy, press FM MODE to change the mode over the MONO. This eliminates the stereo effect, but the noise will be greatly reduced.
To return to the stereo mode, press FM MODE again.

Receiving Broadcasts

Scanning Stations Automatically (Auto Tuning)

When you do not know the frequency of the station to be received, proceed as follows.



1 Press TUNER.

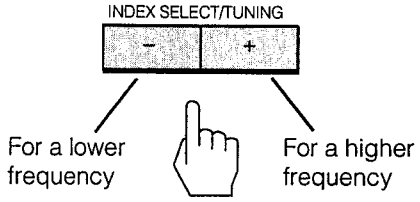
Frequency or the station index name you created is displayed.
The FUNCTION buttons change to the numeric buttons.

2 When the index name is displayed, press DISPLAY INDEX to set to the FREQ mode.

The frequency appears on the display.

3 Select FM or AM.

4 Press INDEX SELECT/TUNING – or + until the desired station is received..



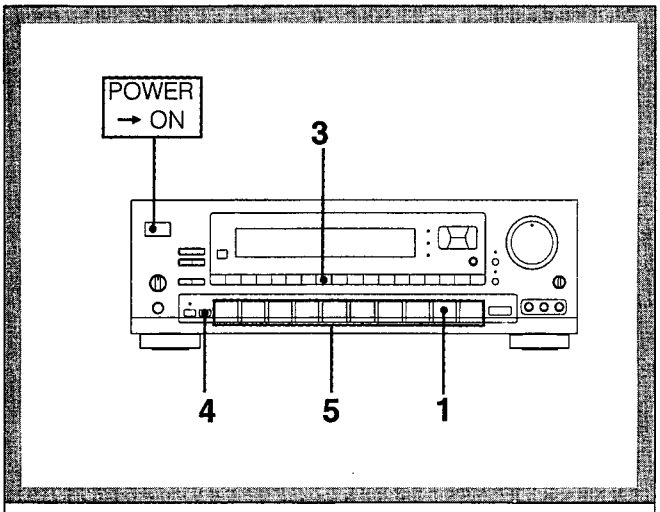
When a station is received, automatic tuning stops.

If the automatic scan stops frequently (for FM reception only)
You can receive only the strong stations by pressing TUNING LEVEL. HIGH appears on the display.

To receive all receivable stations again
Press TUNING LEVEL so that HIGH goes off.

Presetting Stations (Station Preset)

A total of 30 FM/AM stations can be memorized in any desired sequence.



1 Press TUNER.

Frequency or the station index name you created is displayed.
The FUNCTION buttons change to the numeric buttons.

2 Tune in the desired station.
(See "Direct Tuning" on page 19 or "Auto Tuning"on page 20.)

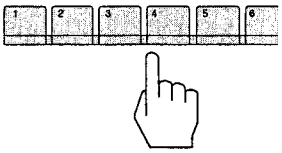
3 Press MEMORY.

MEMORY appears on the display.

4 While MEMORY appears, select the memory page (A, B or C).

Each time SHIFT is pressed, A, B or C is indicated cyclically.

5 While MEMORY appears, press the desired number.



Repeat above steps for presetting other desired stations.

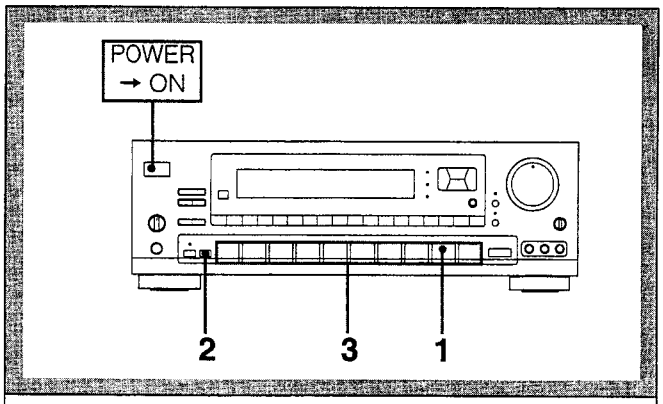
Replacing a preset station
Preset another station on the number of the station to be replaced. The previously preset station will be erased.

Receiving Broadcasts

Tuning in a Preset Station (Preset Tuning)

There are two ways to perform the preset tuning.
In the method A, the direct tuning, select by designating the desired preset station number directly with the numeric button. In the method B, the scan tuning, select the preset station with the PRESET –/+ button.

Method A: Direct tuning



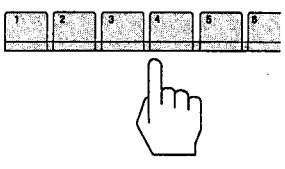
1 Press TUNER.

Frequency or the station index name you created is displayed.
The FUNCTION buttons change to the numeric buttons.

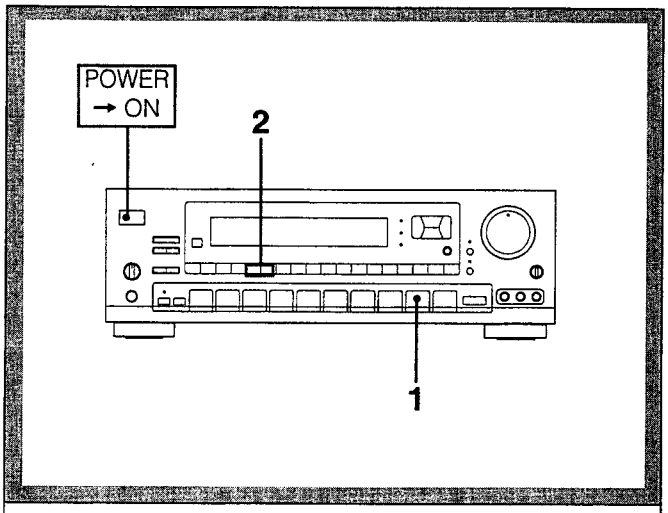
2 Select the memory page (A, B, or C).

Each time SHIFT is pressed, A, B or C is indicated cyclicallly.

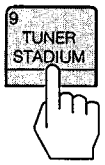
3 Designate the desired preset station number with the numeric button.



Method B: Scan tuning

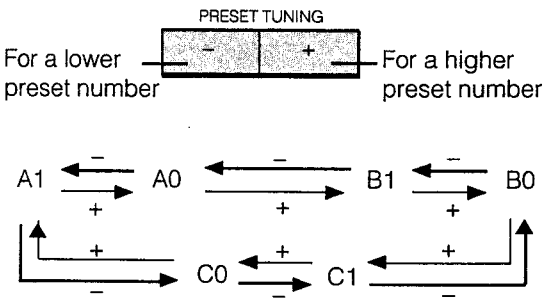


1 Press TUNER.



Frequency or the station index name you created is displayed.
The FUNCTION buttons change to the numeric buttons.

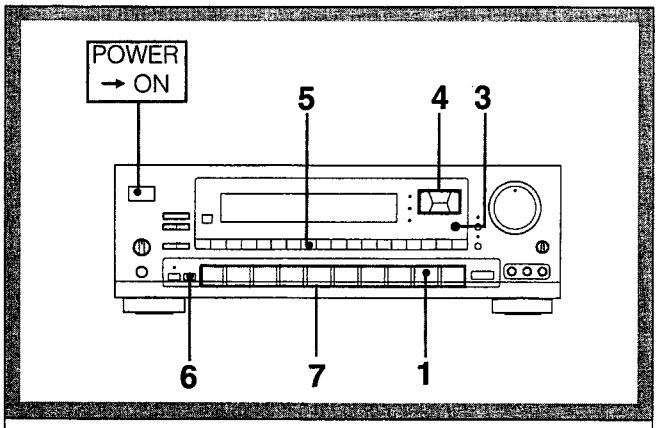
2 Select the desired preset station with PRESET TUNING – or +.



IMPORTANT
The memorized station is maintained for approximately one month even if the power cord is disconnected from the AC power outlet. If they are erased, store the stations again.

Labeling the Preset Stations (Station Index)

You can divide preset stations under index names you create (up to 5 characters). If you want to categorize the preset stations by kinds of music, for example, create indexes such as ROCK, JAZZ, etc.



1 Press TUNER.

Frequency or the station index name you created is displayed.
The FUNCTION buttons change to the numeric buttons.

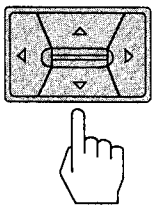
2 Tune in the desired station with Preset Tuning.

3 Press CURSOR MODE to select the INDEX mode.

CURSOR MODE ——
TITLE MENU

The INDEX indicator lights up.

4 Create an index name.



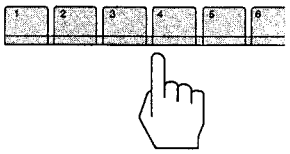
To select a letter or number, press △ or ▽.
To change the position, press ◁ or ▷.

5 Press MEMORY.

MEMORY appears on the display.

6 While MEMORY appears, select memory page (A, B or C).

7 While MEMORY appears, press the desired number.



8 Repeat steps 2 through 7 for all other stations you want to assign an index name.

To clear the index name
Press TUNER in step 4.

When pressing TUNER in step 3 or 4
- The index name blinks and the index name you already created is displayed cyclically by pressing △ or ▽.
- To designate the same index name as the one you already created, select the desired name by pressing △ or ▽ and then follow step 6.

If you store an already categorized station under any other index name
Only the last selected category will be valid. Each station can be stored under only one index name

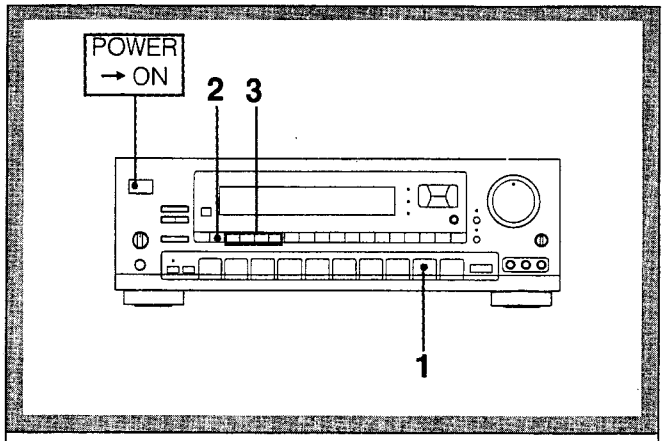
To display the frequency and index name of preset stations
Each time DISPLAY INDEX is pressed, frequency and index name of the preset station are alternately displayed.

Usable letters and symbols

(space)!→#←%&'( )*+,-./0123456789:;<=>?↑ABCDE
FGHIJKLMNOPQRSTUVWXYZ[\]II_↓abcdefghijklm
nopqrstuvwxyz

Receiving Broadcasts

Selecting a Station among the Preset Stations in the Index (Index Tuning)



1 Press TUNER.

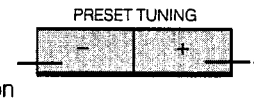
Frequency or the station index name you created is displayed.
The FUNCTION buttons change to the numeric buttons.

2 Press DISPLAY INDEX to set to the INDEX mode.

When the no index name is memorized, "- - - - -" appears on the display.

3 Select the desired station.

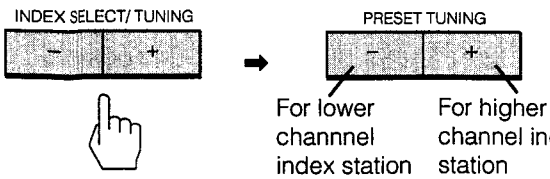
- To select a station in the same index:



For lower channnel index station

For higher channel index station

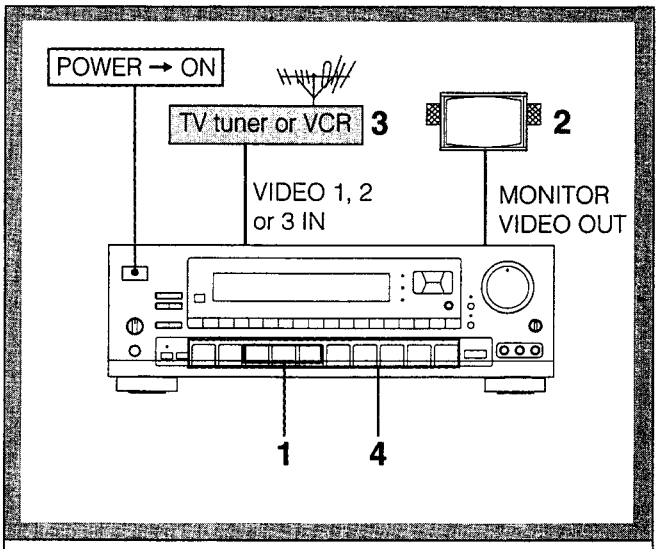
- To select a index station other than the displayed index station:



For lower channnel index station

For higher channel index station

Receiving FM Simulcast TV Programs

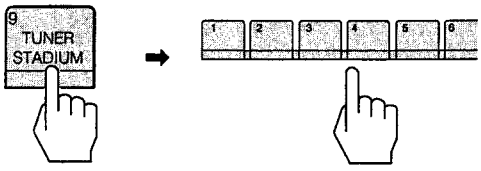


1 Select VIDEO 1, VIDEO 2 or VIDEO 3.
VIDEO 1, VIDEO 2 or VIDEO 3 appears on the display.
According to video inputs connected to an equipment to which the VHF antenna is connected.

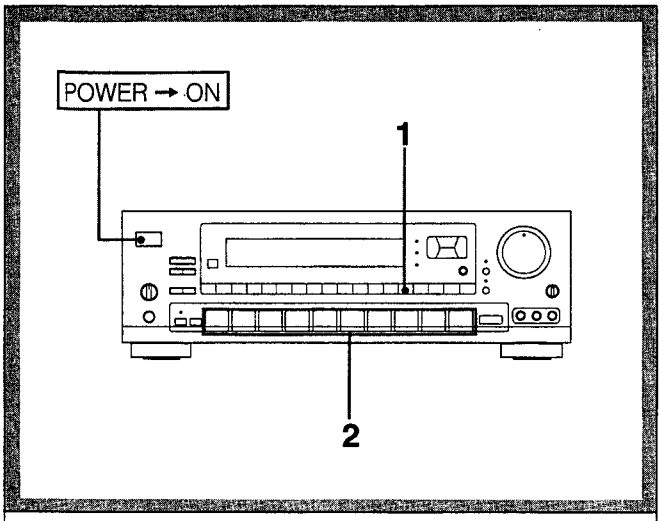
2 Turn on the monitor TV.

3 Select the desired program on the TV tuner or the VCR.

4 Select TUNER and tune in the FM simulcast TV program on the receiver.



Selecting a Factory-preset Sound Effects



1 Press USER/PRESET.
PRESET appears on the display.

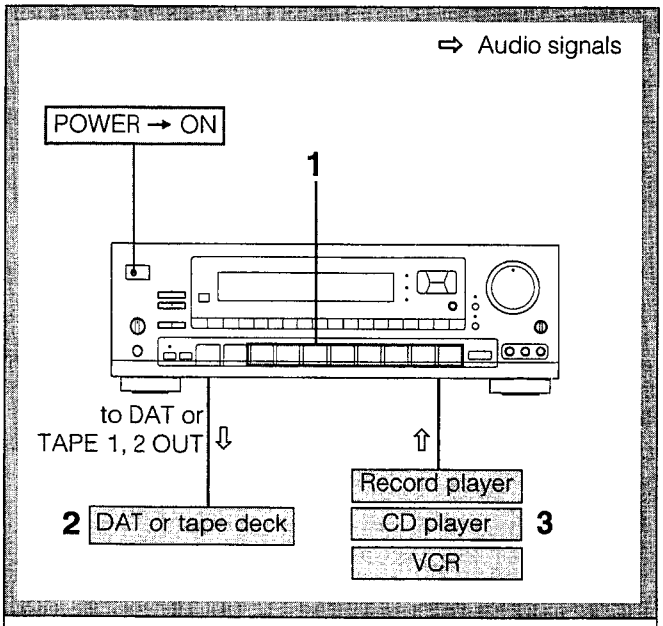
2 Press the desired SOUND FIELD.

SOUND FIELD	Applications
DOLBY	For Dolby surround encoded video programs
THEATER	For movie programs on video tapes or laser discs
LIVE	For music programs on video tapes or laser discs
HALL	For orchestral music, chamber music or an instrumental solo
DISCO	For disco music
JAZZ	For jazz
OPERA	For operas or musicals
CHURCH	For church music or the pipe organ
STADIUM	For live concert in an open-air stadium
ACOUSTIC	The surround effect is defeated and only the equalizer effect can be obtained.

Refer to page 30 for the characteristic of each mode.

Recording an Audio Source

Recording onto an Audio Tape Deck or DAT Deck



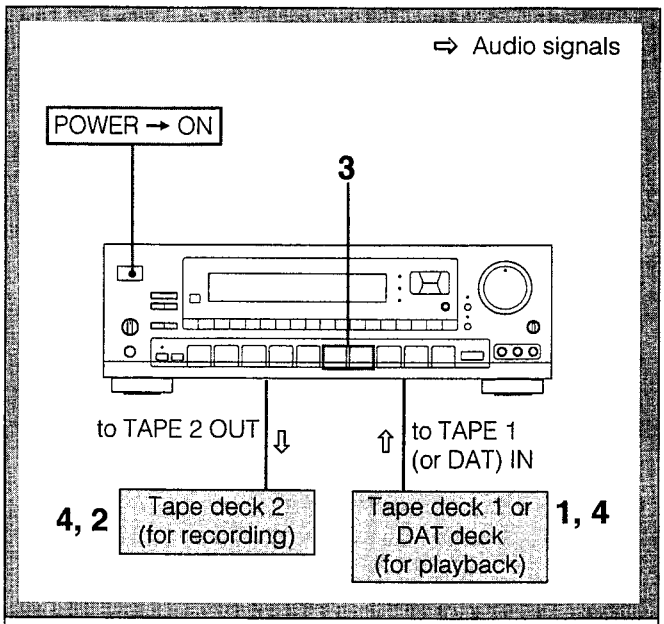
1 **Select the desired program with the FUNCTION button.**
For an FM/AM broadcast, tune in the desired station

2 **Set the tape (DAT) deck in the recording mode.**

3 **Start playback of the selected program source.**

Monitoring the recorded sound
If you have connected a 3-head tape deck to the TAPE 2 jacks, you can monitor the recording results. While recording or dubbing, press TAPE 2 MONITOR so that the TAPE 2 MONITOR indicator lights up. To listen to the source sound again, press the button again so that the indicator goes off.

Tape Dubbing



1 **Insert the recorded tape into tape deck 1 (or the DAT deck).**

2 **Insert a blank tape into tape deck 2 and adjust the recording level.**

3 **Press TAPE 1 or DAT to select the deck for playback.**

4 **Start the playback of the tape (or the DAT) in tape deck 1 (or the DAT deck), and set tape deck 2 in the recording mode.**
Dubbing will start.

Note on tape dubbing
Tape dubbing is possible only in the following directions:

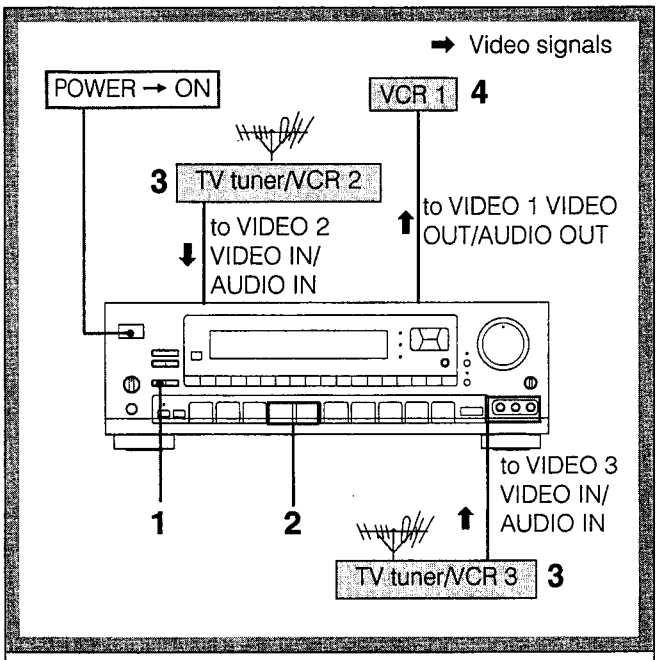
From (playback deck)	To (Recording deck)
Tape deck connected to TAPE 1 IN	Tape deck connected to TAPE 2 OUT
	DAT deck connected to DAT OUT
DAT deck connected to DAT IN	Tape deck connected to TAPE 1 or 2 OUT

Press the FUNCTION button according to the playback deck.

Editing a Video Source

Video Tape Dubbing

If the AUDIO indicator is lit in the display window, press the EDIT AUDIO button to make the indicator go out.



1 Select the playback VCR with EDIT VIDEO.
To select VCR 2, press EDIT VIDEO so that "2▷ 1" appears on the display.
To select VCR 3, press EDIT VIDEO so that "3▷ 1" appears on the display.

2 Press VIDEO 2 or VIDEO 3 to select the video signal to monitor on the monitor TV according to the VCR to be played.
VIDEO 2: for the VCR 2
VIDEO 3: for the VCR 3

3 Set the playback VCR to the playback mode.

4 Set the VCR 1 to the recording mode.
Dubbing will start.

— Video Tape Editing —

To switch the playback VCR during dubbing
Press EDIT VIDEO. Each time you press the button, the playback VCR switches from the VCR 2 to the VCR 3 (or the VCR 3 to the VCR 2).

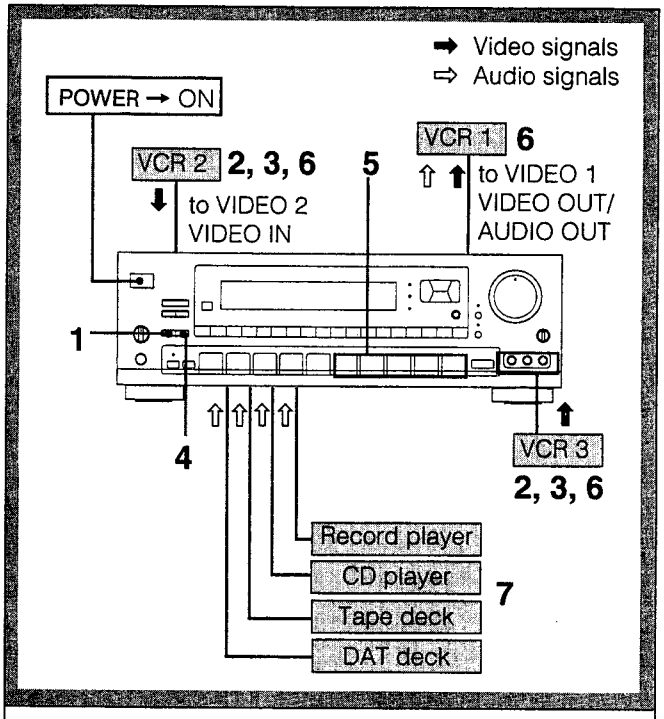
To view the other video source(s) on the monitor TV during dubbing
Press the appropriate function selector, VIDEO 1, VIDEO 2, or VIDEO 3.

To listen to an audio program during video tape dubbing
1 Press the appropriate function selector.
2 Start the selected audio program source.

Editing a Video Source

Adding New Sound on a Video Tape during Video Editing

During video tape editing, you can add the desired sound on the recording VCR from various audio program sources.



1 Select the playback VCR with EDIT VIDEO.
To select VCR 2, press EDIT VIDEO so that "2▷ 1" appears on the display.
To select VCR 3, press EDIT VIDEO so that "3▷ 1" appears on the display.

2 Set the playback VCR to the playback mode.

3 At the point where audio dubbing starts, press the pause button on the playback VCR.

4 Press EDIT AUDIO.

AUDIO appears on the display.

5 Select the audio program source.

6 Release the pause mode of the playback VCR and set the VCR 1 to the recording mode.

7 Start playback of the selected audio program source.
Video dubbing starts and the audio program source is also recorded on the VCR 1 simultaneously.

What Is the Digital Signal Processor ?

The STR-D2090/STR-D1090 incorporates digital signal processing circuitry which consists of a digital surround processor and a digital parametric equalizer.

- The digital surround processor electronically reproduces the acoustics of various listening situations.
- The digital parametric equalizer controls the output level of specific frequencies to finely adjust the frequency responses.

These 2 digital sound effects allow you to create the optimum sound quality and sound atmosphere in your room.

10 recommended sound field programs (combination of settings of the surround and parametric equalizer have been preset in the factory. Since these programs are appropriate for the most types of music and listening situations, you can enjoy the digital sound effects by just selecting the sound field programs according to the program source. And you can also manipulate various parameters to finely tune the factory-preset settings to your room, or create original sound effects as you like. (Page 35)

This manual described about the sound field program in the following order:
Surround effect
Digital parametric equalizer
Storing your private sound field program

Sound Field Setting

Table of Adjustable Parameters

The surround sound and digital parametric equalizer have each adjustable parameter.

Parameter \ SOUND FIELD		DOLBY	THE-ATER	LIVE	HALL	DISCO	JAZZ	OPERA	CHURCH	STADIUM	ACOUS-TIC
Equalizer		O	O	O	O	O	O	O	O	O	O
Surround sound	Room size	X	O	O	O	O	O	O	O	O	X
	Wall	X	O	O	O	O	O	O	O	O	X
	Seat position front/rear	X	O	O	O	O	O	O	O	O	X
	Seat position left/right	X	O	O	O	O	O	O	O	O	X
	Effect level	X	O	O	O	O	O	O	O	O	X
	Reverb time	X	O	O	O	O	O	O	O	O	X
	Delay time	O	X	X	X	X	X	X	X	X	X
	Rear level	O	O	O	O	O	O	O	O	O	X
	Center level	O	O	O	X	X	X	X	X	X	X

Refer to pages 32 to 38 for adjusting these parameter.

Getting Ready for Dolby Surround Sound

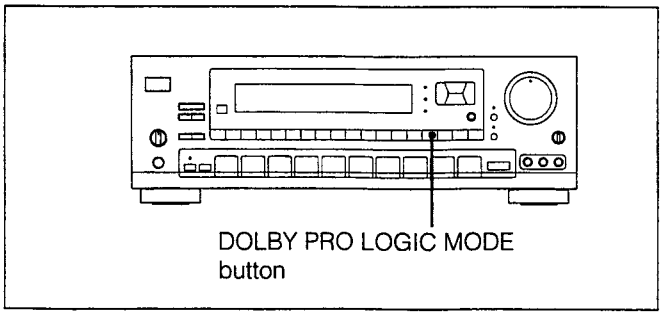
This section describes about selecting the speaker configuration and then adjusting the speaker volume and the delay time of the rear speakers so that you can enjoy the Dolby surround sound.

Placement of Speakers and Selecting the PRO LOGIC MODE

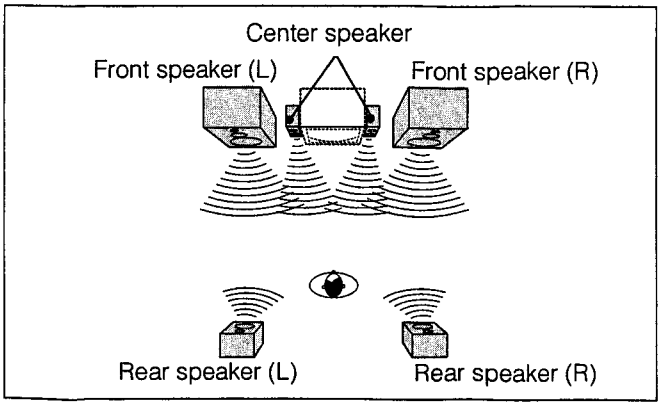
The Dolby Pro Logic Surround Decoder has the same functions for playback, such as movie theaters and gives a theater-like experience in your listening room, naturally reproducing the audio sound field.

The STR-D2090/STR-D1090 incorporates a decoder which reproduces the specially encoded surround sound of Dolby surround video programs.
In the Dolby surround mode, select the speaker operation mode according to your speaker configuration by pressing the DOLBY PRO LOGIC MODE button. Each time the DOLBY PRO LOGIC MODE button is pressed, the DOLBY PRO LOGIC MODE is changed in the following order:

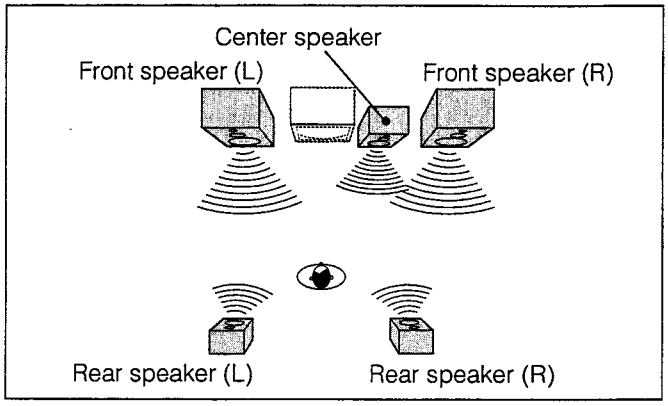
→ NORMAL → WIDE → PHANTOM → 3 CH. LOGIC →



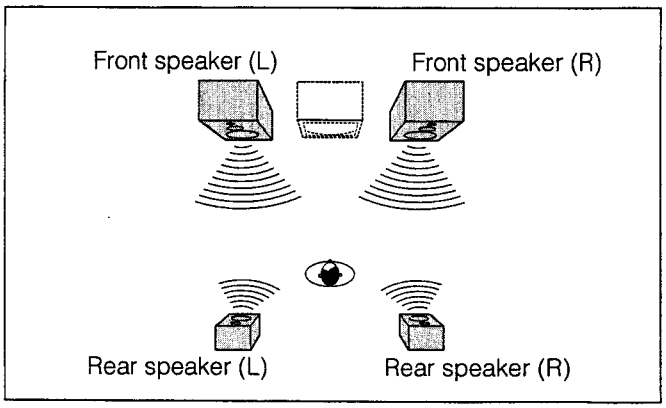
NORMAL mode
Select this mode if you use a small center speaker. The bass sound of the center channel is output from the front speakers, as a small speaker cannot produce enough bass.



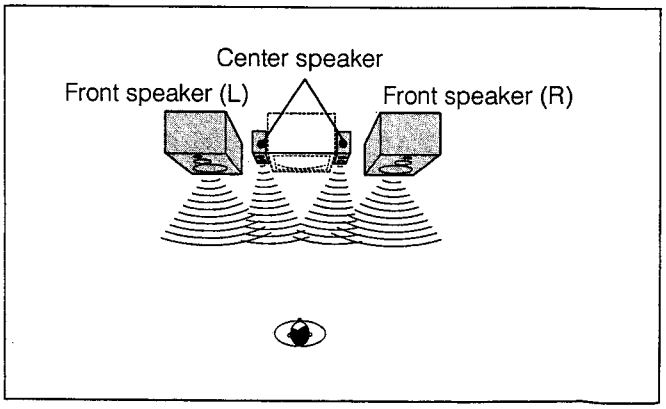
WIDE mode
Select this mode if you use a medium to big center speaker.



PHANTOM mode
Select this mode when you play back a Dolby surround program source without using a center speaker. The sound of the center channel is output from the front (L and R) speakers.



3CH. (Channel) LOGIC mode
Select this mode when you play back a Dolby surround program source only with the front and center speakers. The sound of the rear channel is output from the front (L and R) speakers.

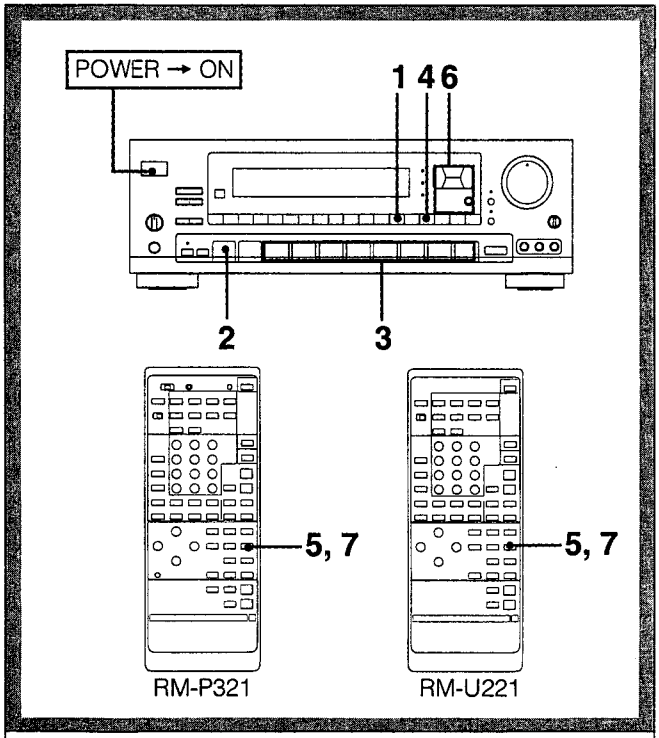


Even for video software which does not carry the DOLBY SURROUND mark
Some commercially available software may have Dolby surround processed sound tracks even though it is not so indicated on the package.

Getting Ready for Dolby Surround Sound

Adjusting the Speaker Volume

To enjoy the surround sound to the maximum on playing any program sources, adjust the front, rear, and center (if connected) speakers to the same volume level. The adjustment must be done with a test tone in the DOLBY SURROUND mode, but the level once adjusted can be used for all surround modes.
You can adjust the volume level from your listening position by using the remote commander.



1 **Press SOUND FIELD ON/OFF to ON.**
The indicator of the last selected sound fieldlights up.

2 **Press DOLBY.**
DOLBY SUR appears on the display.

3 **Select a program source with a FUNCTION button and start playback.**

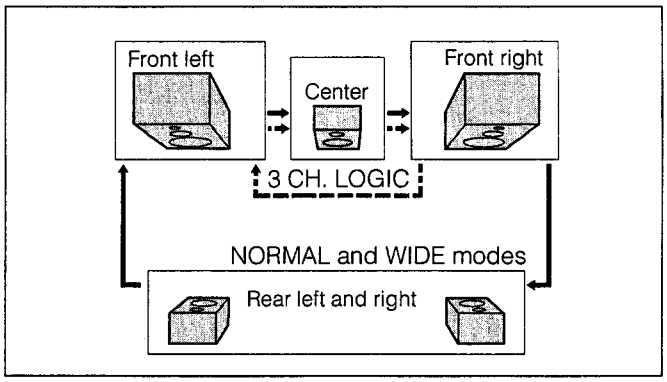
4 **Select the Dolby pro logic mode with the DOLBY PRO LOGIC MODE button according to your speaker system.**

5 **Press T. TONE on the remote commander to set to on.**

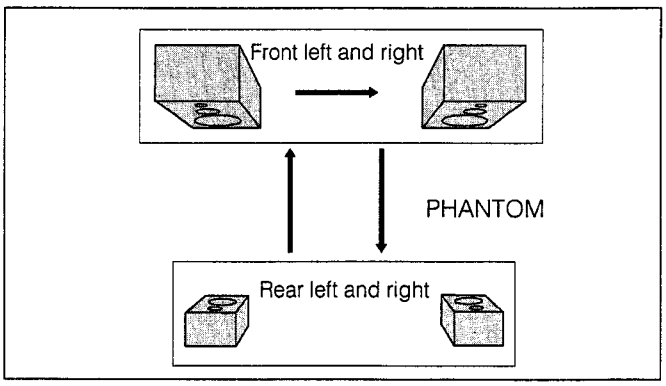
6 **Press CURSOR MODE.**
The SURR (surround) indicator lights up.
To adjust the level of rear speakers
Press △ or ▽ to select the rear level mode and then adjust the level with ◁ or ▷ or REAR LEVEL +/– on the remote commander.
To adjust the level of center speakers
Press △ or ▽ to select the center level mode and then adjust the level with ◁ or ▷ or CENTER LEVEL +/– on the remote commander so that sound from each speaker is heard in the same volume level at the listening position. (When adjusting the VOLUME control on the receiver, all speakers are adjusted simultaneously.)

7 **Press T. TONE on the remote commander to set to off.**

Sequence of the test tone
In a system with a center speaker:
The test tone will be output automatically from the front L, center, front R, and the rear speakers in succession.



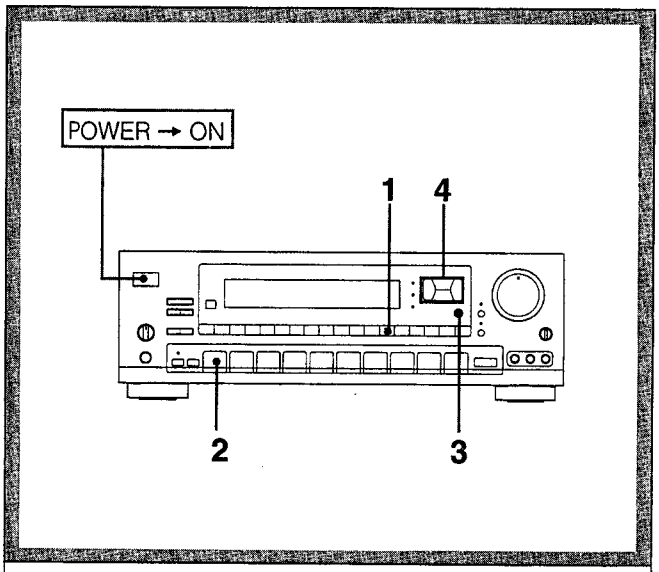
In a system without a center speaker:
The test tone will be output automatically from the front left and right speakers and the rear speakers alternately.



Adjusting the Delay Time of the Rear Speakers

— for Dolby surround mode

The delay time is a time between the surround sound from the front and that from rear speakers. The delay time is adjustable from 15 ms to 30 ms.



1 **Press SOUND FIELD ON/OFF to ON.**
The last selected sound field is displayed in box.

2 **Press DOLBY.**
DOLBY SUR appears on the display.

3 **Press CURSOR MODE.**
The SURR (surround) indicator lights up.

4 **Press △ or ▽ to select the delay time mode and adjust the delay time with ◁ or ▷.**

To turn off the surround effect
Press SOUND FIELD ON/OFF to OFF.
The normal sound without surround and equalizer effect will resume.

To memorize the speaker volume and the delay time of the rear speakers
Press USER/PRESET to set to the USER mode and then adjust the speaker volume and delay time with the cursor operation buttons.

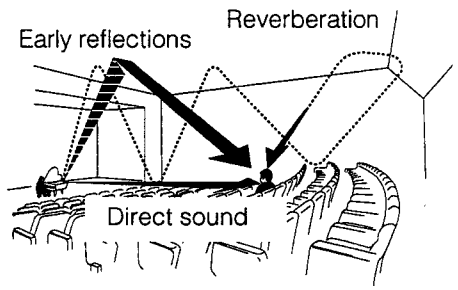
Adjusting the SOUND FIELD program

Understanding the Digital Surround Processor

The sound heard in a place such as a concert hall or a movie theater consists of direct sound, and early reflected sound (early reflections) and a reverberative sound (reverberation). The acoustics of the room affect the way these three sounds are heard. We can estimate the size or the type of a hall by listening to and differentiating these three kinds of sound.

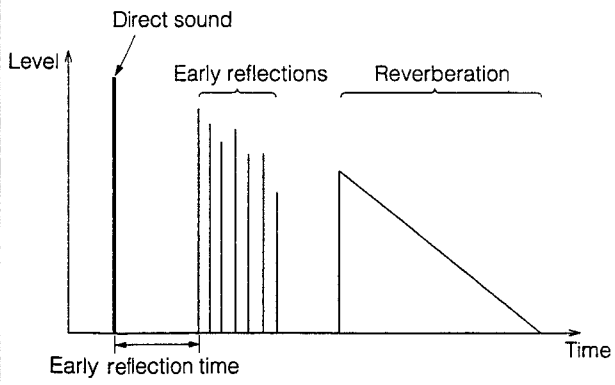
The STR-D2090/STR-D1090 reproduces the early reflections and the reverberation using its digital signal processor and allows you to design a variety of sound field in your own room. The unit incorporates 10 types of the SOUND FIELD program, and you can select the desired SOUND FIELD mode by pressing the SOUND FIELD button. Also you can adjust several parameters within each mode to maximize the effect in your listening room.

Types of the sound



The sound transition of the direct sound, early reflections and reberveration can be illustrated as below:

Transition of the sound



Note

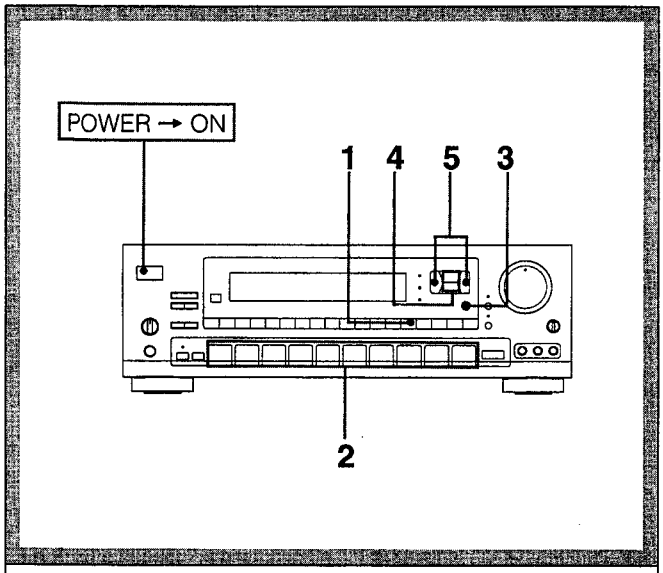
Each surround mode has several internal (fixed) parameters in addition to the adjustable parameters explained in this section. Therefore, surround modes will not become the same even if you set all adjustable parameters the same.

Characteristics of the SOUND FIELD program

SOUND FIELD	Characteristics	Appropriate music source
DOLBY	Decodes programs processed with the Dolby surround.	Dolby surround processed software
THEATER	Adds the reflection of a theater to decoded signals of the Dolby prologic decoder.	Dolby surround processed movie software
LIVE	Adds the reflection of a large concert hall to decoded signals of the Dolby prologic decoder.	Dolby surround processed music software
HALL	Reproduces the acoustics of a rectangular concert hall with soft sound. It is effective for playing a program source with hard sound.	Solo, medium-size orchestra or classic
DISCO	The equalizer boosts high and low frequencies, and the dynamic sounds are reproduced.	Pops or disco
JAZZ	Reproduces the acoustics of a live house, adding sharpness to sounds.	Jazz
OPERA	Reproduces the acoustics of an opera house, keeping the clearness of the vocal music.	Opera
CHURCH	Reproduces the acoustics of a church made of wood	Baroque music, string orchestra or choral group
STADIUM	Reproduces the acoustics of an outdoor stadium with a long pre-delay time. It is effective for playing a program source recorded in a stadium.	Pops or rock music
ACOUSTIC	The surround effect is defeated.	

Adjusting the Surround Effect

Before adjusting parameters, play back the program source. You can adjust parameters while listening to the actual sound.



1 **Press USER/PRESET to set to the USER mode when you store your private setting or to set to the PRESET mode when you do not store your setting.**

2 **Press the desired SOUND FIELD program.**

3 **Press CURSOR MODE to select the SURR (surround) mode.**
The SURR (surround) indicator lights up.

4 **Press △ or ▽ to select the desired parameter.**

5 **Adjust the parameter by pressing ◁ or ▷.**

Tips for adjusting the main parameters
The following procedure allows you to make the desired sound field more effectively.

1 Select the desired factory-preset sound field program.
2 Adjust the effect level.
3 Adjust the reverberation time.
4 Adjust other parameters, if necessary.

When you store a new SOUND FIELD effect
The previous SOUND FIELD effect is erased and the new one will be replaced.

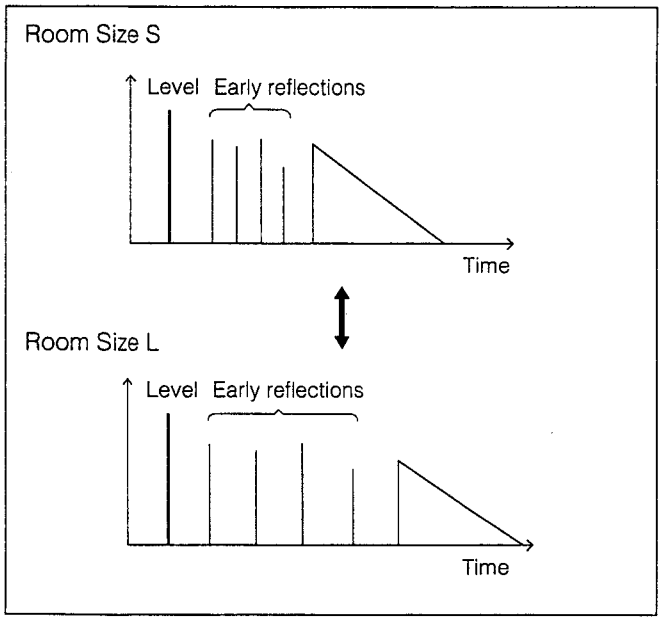
Even if AC power cord is disconnected
The stored data is maintained for approximately 1 month.

When selecting ACOUSTIC
ACOUSTIC does not have the surround effect and only the equalizer effect can be available. So when selecting ACOUSTIC, only the setting of parametric equalizer can be adjusted.

Adjusting the SOUND FIELD program

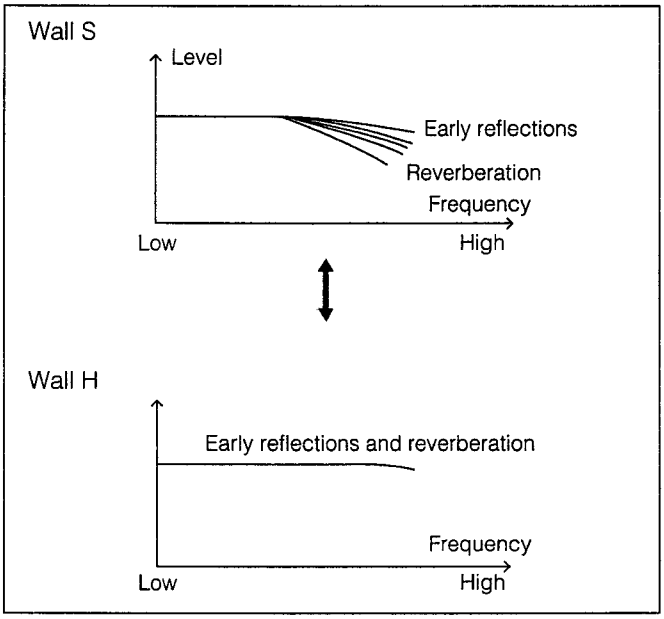
■ Room Size Simulation

The sound emitted from a sound source is reflected many times between the left and right walls, ceiling, and floor before it reaches our ears. In a large room, the sound takes more time to bounce from one surface to another than in a smaller room.
The ROOM parameter controls the spacing of early reflections to simulate the room size. The S indicator on the display signifies a small room, the L indicator signifies a large room and the middle point designates the standard room size.



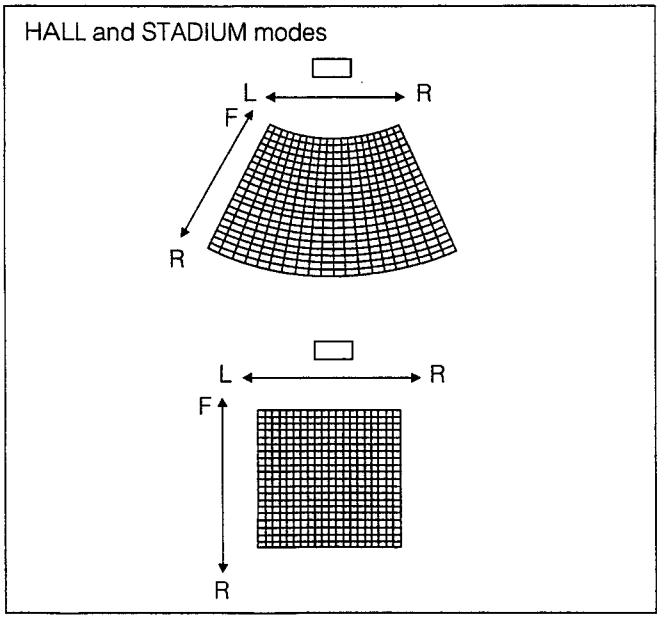
■ Wall Material Simulation

When sound is reflected by a wall made of soft material such as wood or a wall covered with a curtain, the high frequency components are reduced. A hard wall is highly reflective and does not significantly effect the frequency response of the reflected sound.
The WALL parameter controls the level of high frequencies to simulate the wall material. The S indicator on the display signifies a soft wall, the H indicator signifies a hard wall, the middle point designates the standard wall made of wood.



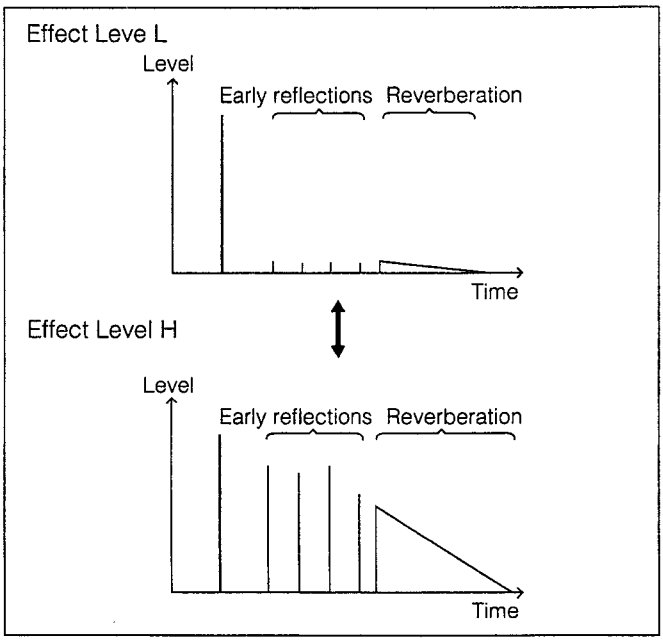
■ Seat Position Simulation

When you sit in the front of a room, you will hear more direct sound from the front speakers, and the component of reflected sounds from the front speakers grows as you move to the rear. Similarly, the component of reflected sound changes when you move from left to right, and vice versa. The F/R and L/R parameters control the balance of the direct and reflected sound and other components of sound to simulate your listening position.
When adjusting the F/R parameter, the F indicator on the display signifies the front position of the room, the R indicator signifies the rear position, the middle point of the indicator designates the center position. When adjusting the L/R parameter, the L indicator signifies the left position of the room, the R indicator signifies the right position, and the middle point of the indicator designates the center position.



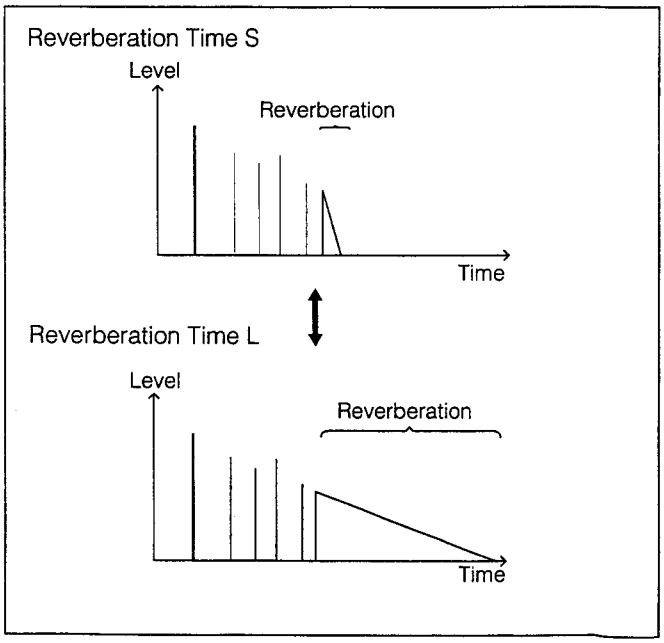
■ Effect Level

Effect level is the combination of the level of early reflections and reverberation. The L indicator on the display signifies the lowest level and the H indicator signifies the highest level. The adjustable level is divided into 20 segments. As you select higher level, the room becomes more "live", and as you select lower level, the room becomes "dead".



■ Reverberation Time

This parameter adjusts the length of the reverberation — the time required for reverberative sound to decrease to –60 dB. The S indicator on the display signifies the shortest reverberation time, the L indicator signifies the longest reverberation time.



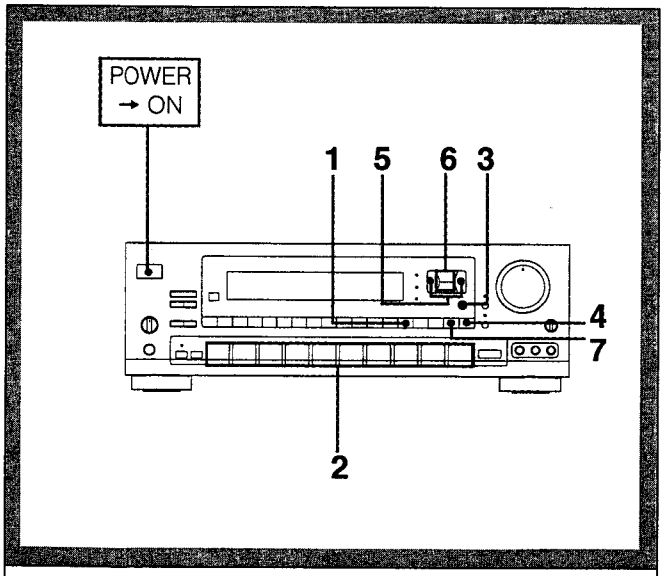
Adjusting the SOUND FIELD program

Understanding the Digital Parametric Equalizer

The parametric equalizer is a tone control system with adjustable center frequency and slope (Q). The STR-D2090/STR-D1090 provides flexible equalization using one-band parametric equalizer with center frequency and slope, and 2-band shelving equalizers with adjustable turnover points.
The equalization curve appearing on the display allows you to accurately adjust the sound quality. The parametric equalizer effects all line output signals including SURROUND (REAR), CENTER.

How to Adjust the Digital Parametric Equalizer

Before adjusting the digital parametric equalizers, play back the program source. You can adjust the equalizer while listening to the actual sound.



1 **Press USER/PRESET to set to the USER mode when you store your private setting or to set to the PRESET mode when you do not store your setting.**

2 **Press the desired SOUND FIELD program.**

3 **Press CURSOR MODE to select the EQ (equalizer) mode.**
The EQ (equalizer) indicator lights up.

4 **Press EQUALIZER BAND to select a frequency band.**
B: Bass
M: Middle
T: Treble

5 **Press ◁ or ▷ to select the frequency you want to adjust.**

6 **Press △ or ▽ to raise or lower the level of the selected frequency.**

7 **Adjust the frequency level of the mid range by pressing EQUALIZER SLOPE if necessary.**

8 **Repeat steps 4 through 7 for other frequency bands until you obtain the desired equalization curve.**

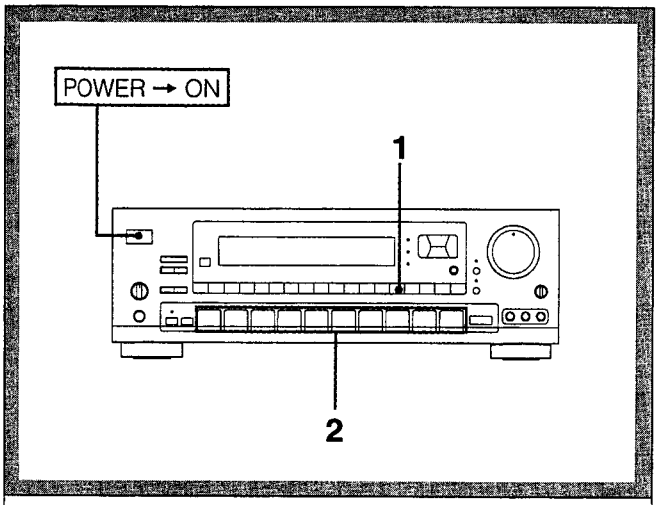
To make the equalization curve flat
Press EQUALIZER FLAT.
You can create a new equalization curve.

On the function of DISPLAY GRAPHIC
Every time you press DISPLAY GRAPHIC, the display of equalizer curve, real time analyzer and peak hold is cyclically switched. Each display shows as followings.
In the DOLBY, LIVE or THEATER mode, the levels of each channel are graphically displayed except when the equalizer curve is displayed.
— Equalizer curve shows the settings of the equalizer controls.
— Real time analyzer (RTA type-1) shows the level of each frequency range.
In the DOLBY, LIVE or THEATER mode, the levels of each channel are displayed.
— Peak hold mode (RTA type-2) shows that this mode holds the highest input of each frequency range for several seconds.
In the DOLBY, LIVE or THEATER mode, peak levels of each channel are held for several seconds.
— Real time analyzer (RTA type-3) shows the highest level of each frequency range.
In the DOLBY, LIVE or THEATER mode, the highest levels of each channel are displayed.

When the center frequency band overlaps the bass or treble frequency band during adjustment
The setting level of each band will accumulate.
The equalization curve appears only between ±10 dB.

Enjoying with Your Private Setting

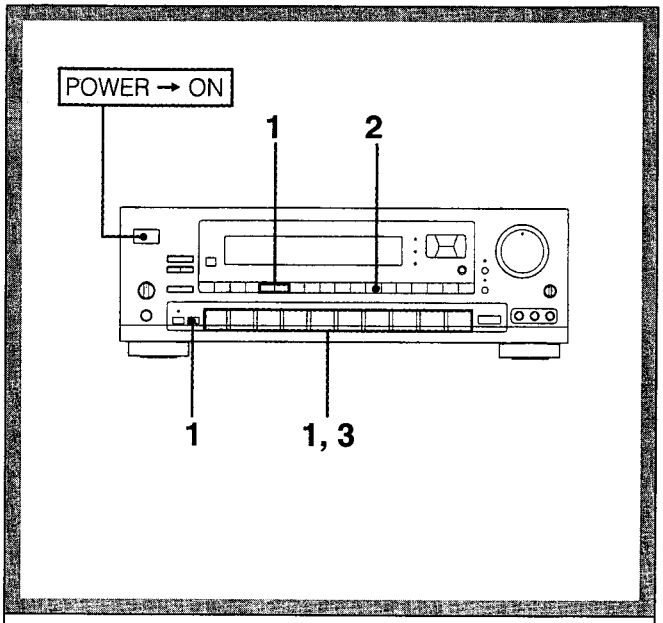
Calling up the Sound Field Setting



1 **Press USER/PRESET to set to the USER mode when you call up your private setting or to set to the PRESET mode when you call up the factory preset setting.**

2 **Press the desired SOUND FIELD program.**

Linking the Sound Field Memory to Preset Stations or Program Source



1 **Tune in a station or select the program source to be linked with sound field data.**

2 **Press SOUND FIELD LINK.**

3 **Press the desired SOUND FIELD program.**

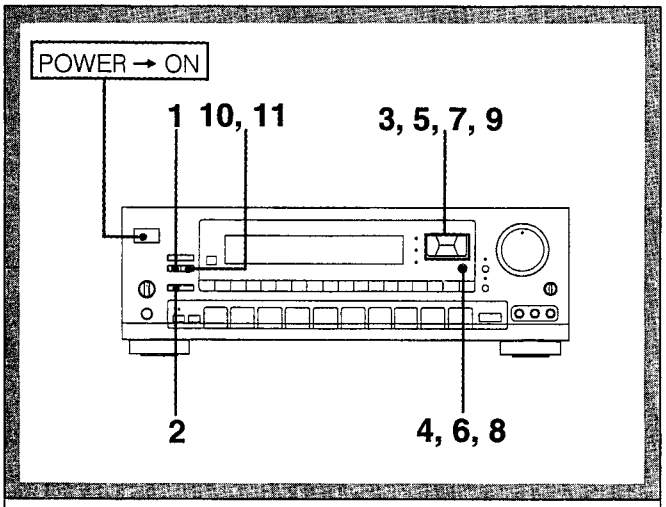
Notes

- When other sound field is selected in the LINK mode, the previous sound field setting linked with the preset station or program source is replaced with the newly selected one. Therefore, if you want to select other sound field without changing the sound field setting in memory, press LINK to turn off the LINK mode and then select other sound field.
- When the sound field setting is adjusted, the sound field setting linked with the preset station or program source is also changed.

Superimposing the Title and Illustration (STR-D2090 Only)

The title function of the STR-D 2090 allows you to select the desired types of title, illustration and colors of characters and back ground and superimpose them. The placement of the title, illustration and characters can be also changeable.

How to Use the Titler Function

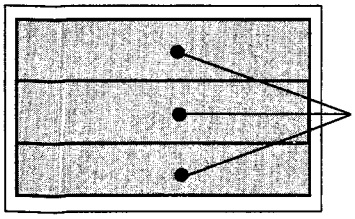


1 **Press TITLE ON/OFF to set to ON.**

2 **Select the playback VCR with EDIT VIDEO.**
To select VCR 2, press EDIT VIDEO so that "2▷ 1" appears on the display. The VCR 2 is automatically selected.
To select VCR 3, press EDIT VIDEO so that "3▷ 1" appears on the display. The VCR 3 is automatically selected.
- The playback VCR cannot be selected with the function selectors.

3 **(1) Select a desired title with △ and ▽.**

(2) Select the position where the title is placed among 3 positions with ◁ and ▷.
The title setting is completed.

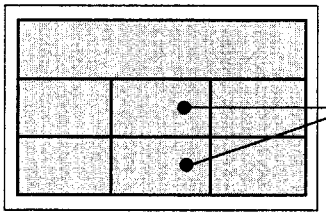


3 positions where the title can be placed.

4 **Press CURSOR MODE/TITLE MENU to enter the illustration setting.**

5 **(1) Select a desired illustration with △ and ▽.**

(2) Select the position where the illustration is placed among 6 positions, except the positions where the title is placed, with ◁ and ▷.
The illustration setting is completed.
The position where the title has been already placed cannot be selected.



6 positions where the illustration can be placed.

6 **Press CURSOR MODE/TITLE MENU to enter the setting of characters.**

7 **(1) Select the position where the characters are placed with ◁ and ▷.**
The position where the title or illustration has been already placed cannot be selected.
Up to 27 characters can be selected for the 1st line, 2nd line and 3rd line. (Up to 81 characters in total.)

(2) Select the characters with △ and ▽.
Usable letters and symbols
!→#←%&'( )*+,–./0123456789:;<=>?↑ABCDE
FGHIJKLMNOPQRSTUVWXYZ[\]II_≠abcdefghijklm
nopqrstuvwxyz|┌┐└┘□■●▲▼◀▶◆♥♠♣(space)_

8 **Press CURSOR MODE/TITLE MENU to enter the color setting of the character.**

9 **(1) Select a desired color of the character from the 17 types of colors including the transparent with △ and ▽.**

(2) Select the color of the background from the 17 types of colors including the transparent with ◁ and ▷.
The color setting of the characters is completed.

10 Operate the playback VCR to locate the desired point where you want to place the title and illustration and press TITLE IN/OUT to IN at the desired point.
TITLE IN appears on the display. At the same time, the unit enters the monitor mode of VCR 1 automatically and the title and illustration which are superimposed on the picture of VCR 1 can be monitored.
- At this time, the playback VCR cannot be selected with the function selectors.

11 At the point where you do not want to place the title and illustration, press TITLE IN/OUT to OUT.
TITLE OUT appears on the display.

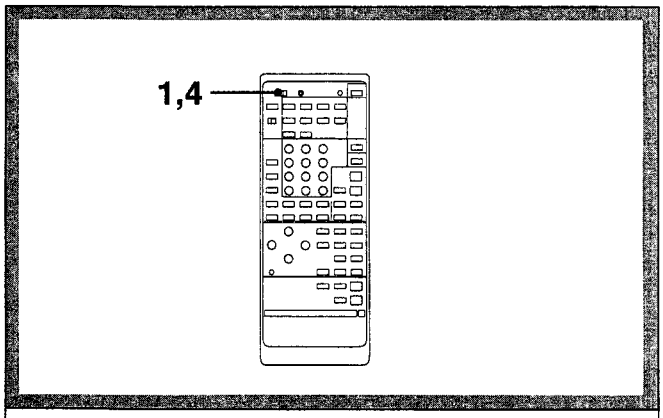
Notes
- When the position of the title or illustration is changed, that of the characters is also changed.
- When TITLE ON/OFF is set to ON, the cursor mode operation buttons cannot be used for the other functions than the title function.
- In the TITLE and ON SCREEN modes, the characters at both ends may not be displayed depending on the type of the monitor TV.

Storing Other Manufacturer's Operating Codes Onto the Remote Commander RM-P321

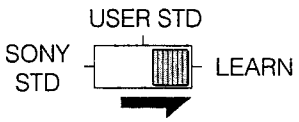
Programming Signals of Other Audio/Video Equipment

The remote commander RM-P321 supplied with the STR-D2090 learns various functions of other remote commanders emitting infrared rays and allows you to control most of audio and video equipment from a distance.

When you manipulate a switch or button on the commander, be sure to point the head of the commander toward the remote control sensor on the front of the receiver. If there is an obstacle between the receiver and the head of the commander, the receiver may not be controlled remotely.



1 Set the mode selector to LEARN.

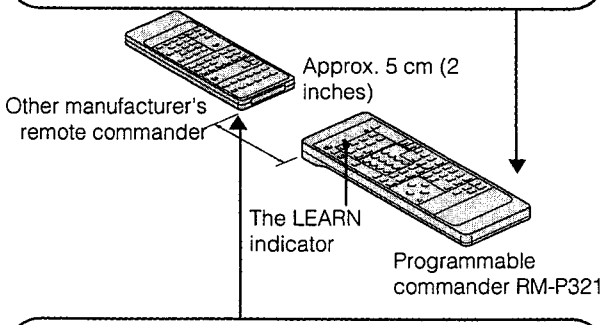


2 Program a signal.

The programmable buttons are changed according to the function mode. See "List of operative buttons in SYSTEM mode" on page 15.

① Select the appropriate function mode with the FUNCTION button when programming the signal in the buttons described in "[3] Other equipment control section" on page 14 (except the SELECT button).

② Press and hold the button which shall "learn" the remote-control signal until the LEARN indicator lights up.



③ Press and hold the button of other manufacturer's remote commander whose signal is to be learned.

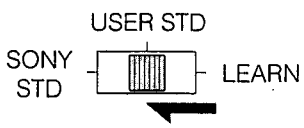
④ Remove your finger(s) from the button(s) after the LEARN indicator goes off.

Note

If the button which cannot be programmed is pressed in step ②, the LEARN indicator blinks.

3 Repeat operation for each button to be programmed.

4 Set the mode selector to USER STD or SONY STD.



The two remote commanders must:
- face straight each other.
- be placed at a distance of approx. 5 cm (2 inches).
- not be moved during programming operation.

After programming
Be sure to test if the equipment really works with the programmed signals.

Number of signals that the commander can learn
It depends on the format of the signal. If you program signals of Sony equipment, approximately 50 - 60 signals can be programmed.

Memory capacity
If the LEARN indicator flashes or does not go out in step **2**-②, ③, the memory capacity has become full. This occurs when other signals stronger than the remote-control signals have been stored because the signals were programmed in a noisy environment or the remote commanders were placed too far apart from each other.
In this case, clear all the signals following the procedure described below and program again from the beginning under the proper conditions.

Notes on programming
- Remote-control signals of equipment of manufacturers other than Sony can be programmed only when they are compatible with the infrared wireless remote control system. Since the programmable commander can "learn" only the signals output from another remote commander, it cannot control equipment that does not use a remote commander.
- Do not attempt to use the programmable commander with an air conditioner or other household appliances.
- Note that there are some special remote-control signals that cannot be programmed.

Programming a new signal onto a previously programmed button

Follow the programming procedure.
The previously programmed signal is cleared and replaced by the new signal.

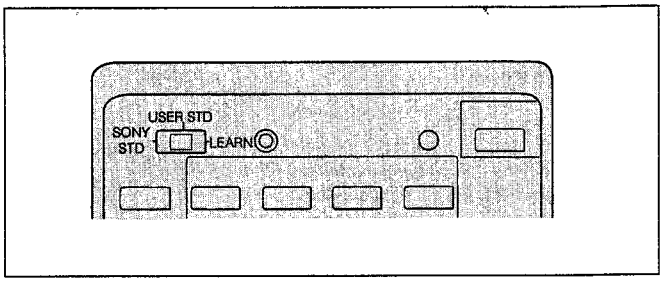
To clear all programmed signals
1 Set the mode selector to LEARN.
2 Press and hold any button of the programmable area until the LEARN indicator lights up.
3 Press PROGRAM CLEAR until the LEARN indicator flashes and goes off.

Note
It is not possible to clear the programmed content of just one button.

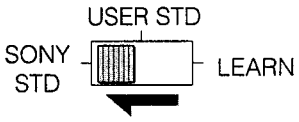
To program a signal onto the ● REC button
It is not possible to operate any equipment with only the ● REC button. To program a signal under the ● REC button, press and hold the following buttons at the same time in step **2**-① .

Controlling Equipment

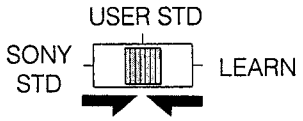
By switching the mode selector as shown below, a single button alternately controls Sony equipment and another manufacturer equipment.



To control Sony equipment



To control equipment with programmed signals



When Sony equipment cannot be remote-controlled
Program the signal in the same way as for equipment from other manufacturers. In this case, even with Sony equipment, set the mode selector to USER STD.

Notes on Battery
If the LEARN indicator does not light when a button is pressed, the batteries are almost exhausted.
When the batteries are exhausted, the remote commander can no longer operate the unit or programming becomes impossible.
If this happens, replace both batteries with new ones. We recommend the use of alkaline batteries for prolonged use.

If no signal has been programmed
The programmable commander can control Sony equipment even when the mode selector is set to USER STD.

If the equipment works incorrectly
Press RESET.
The programmed contents of the buttons are not cleared by pressing RESET.

Troubleshooting Guide

Before proceeding through the check list below, examine the connections and the procedures outlined in the manual. Should any problem persist after you have checked the following items, consult your nearest Sony dealer.

Problem	Cause	Solution
No FM station can be located by Auto-Tuning operation.	The signal strength of the stations is too weak.	Press TUNING LEVEL to set the receiving signal level low.
		Check the antenna connection.
The STEREO indicator flickers or does not appear when receiving stereo programs.	A very weak FM station or a noisy FM program is received.	Adjust the antenna or connect an external FM antenna.
		Press FM MODE to set to MONO mode.
No station can be tuned in by Auto- Tuning operation.	The AM tuning interval is set incorrectly.	Change the tuning interval according to the AM frequency allocation system of your country. (See page 5)
	The signal strength of the station is too weak for Auto-Tuning.	Adjust the antenna.
		Directly tune in the stations. (See page 19)
No stations can be tuned in by pressing PRESET TUNING +/–.	No stations have been preset.	Preset the stations. (See page 21)
No sound is heard even if you adjust VOLUME.	The speaker or program source equipment is not connected correctly.	Connect the equipment correctly.
	The SPEAKERS selector is not set correctly.	Set the selector correctly.
	TAPE 2 has been pressed for a program source other than tape deck 2. (The indicator is lit.)	Press the button to disengage.
	A wrong function selector has been pressed.	Press the correct function selector.
	The function switch on the VCR is not set correctly.	Check and set it correctly.
No sound or sound at very low level is heard from rear speakers.	SOUND FIELD function is turned off.	Press SOUND FIELD ON/OFF to turn on the function.
	Monaural program source is played back in Dolby surround mode.	Select the other modes.
Sound is heard only at a very low volume.	MUTING has been pressed. (The MUTING indicator is lit.)	Press the button to disengage.
One channel does not transmit audio, or the volume from the left and right speakers is unbalanced.	The BALANCE control is not set appropriately.	Adjust the BALANCE control.
	The speaker or program source is not connected correctly.	Check and properly connect the equipment.
There is an abrupt loss of sound from one or both of the speakers, and the PROTECTOR indicator flickers in the display window.	A short-circuit problem activates the protective circuit.	Turn off the unit, eliminate the short- circuit problem and turn on the power again. If there is no short-circuit problem, consult your nearest Sony dealer.

Problem	Cause	Solution
Sound transmitted from the speakers is reversed.	The speakers are not connected correctly.	Connect the right speaker to the R SPEAKER terminals and the left speaker to the L SPEAKER terminals.
There is lack of bass sound or the instrument position is obscure.	The ⊕/⊖ connection of the speaker is reversed.	Connect the speaker with the correct phase.
Severe hum or noise is heard.	The connecting cords are not shielded type.	Use shielded type cords.
	A transformer, motor, TV or fluorescent light affects the connecting cords.	Place the connecting cords in a location away from a transformer or motor, and at least 3 meters (10 feet) from a TV set or a fluorescent light.
	The audio components are too close to a TV set.	If both are used at the same time, separate the TV from the audio components.
	The unit is not grounded.	Connect the ground wire to the antenna ground terminal.
	The connections are loose.	Make secure connections.
	The plugs and jacks are dirty.	Wipe the plugs and jacks with a cloth lightly dampened with alcohol.
The CURSOR mode operation buttons do not function.	The unit enters the ON SCREEN mode.	Press ON SCREEN ON/OFF to disengage the ON SCREEN mode.
Surround effect cannot be obtained.	The unit is in a wrong mode.	Press CURSOR MODE to set the SURR (surround) mode.
	Surround circuit is turned off.	Set the FUNCTION/SOUND FIELD/PRESET TUNING buttons to the SOUND FIELD mode and select an appropriate SOUND FIELD.
Equalization curve adjustment is impossible.	The unit is in a wrong mode.	Press CURSOR MODE to set the EQ (equalizer) mode.
	Equalization circuit is turned off.	Set the FUNCTION/SOUND FIELD/PRESET TUNING buttons to the SOUND FIELD mode and select an appropriate SOUND FIELD.
The FUNCTION buttons do not change to the SOUND FIELD buttons even after pressing one of the FUNCTION buttons except TUNER or these buttons do not change to the numeric buttons even after pressing TUNER.	The FUNCTION/SOUND FIELD/PRESET TUNING buttons are set to the manual mode.	Set to the auto mode. (See page 11)
The remote commander will not operate.	The batteries are exhausted.	Replace the batteries with new ones.
	The commander head is not pointed toward the unit's front.	Point the commander head toward the receiver.
The equipment cannot be operated.	There is an object between the commander and the receiver.	Remove the object.
	The mode of the receiver is not same with that of the remote commander.	Press the desired FUNCTION button again.
The commander signal cannot be programmed.	There is noise interference.	Place both remote commanders apart from the source of noise.
The LEARN indicator goes off after flashing.	The batteries are exhausted	Replace the batteries with new ones.
	The internal memory capacity is full.	Clear all the signals and program again. (See page 43)

Specifications

Audio Power Specifications

POWER OUTPUT AND TOTAL HARMONIC DISTORTION

With 8-ohm load, both channels driven, from 20 - 20,000 Hz, rated 120 watts per channel minimum RMS power, with no more than 0.04 % total harmonic distortion from 250 milliwatts to rated output.

	Surround mode (8 ohms at 1 kHz)	Stereo mode
FRONT	75 W + 75 W	120 W + 120 W
CENTER*1	75 W	—
REAR	30 W + 30 W	—

*1 (only in the DOLBY, THEATER and LIVE modes)

Other Specifications

Dynamic power output (in the stereo mode)	8 ohms, at 1 kHz IHF	185 + 185 watts
	4 ohms, at 1 kHz IHF	235 + 235 watts
Frequency response	PHONO	RIAA equalization curve ±0.5 dB
	CD, DAT, TAPE 1,2 VIDEO 1,2,3	10 Hz — 20 kHz $^{+0}_{-1}$ dB
Damping factor (8 ohms, at 1kHz)		50
Input sensitivity/ impedance	PHONO MM	4 mV, 50 kilohms
	DAT,CD, VIDEO 1,2,3 TAPE 1,2	250 mV 50 kilohms
S/N	PHONO MM	87 dB 79 dB*2(A,2.5mV)
	DAT, CD VIDEO 1,2,3 TAPE 1,3	105 dB 85 dB*2(A,150mV)

*2 '78IHF

Output sensitivity/ impedance	DAT OUT, TAPE OUT 1,2 VIDEO 1	250 mV 10 kilohms
	SPEAKERS	Accepts speakers of 8-16 ohms
	HEADPHONES	Accepts headphones of high and low impedance
	SURROUND OUT REAR	1 V, 1 kilohm
	SURROUND OUT CENTER	1 V, 1 kilohm
	SURROUND OUT MONO	1 V, 1kilohm
MUTING		-20dB
DBFB		+10 dB at 70Hz

Digital signal processor section

Modulation (A/D conversion)		High Density Linear Converter
Demonstration (D/A conversion)		High Density Linear Converter (Pulse D/A Converter)
Sampling frequency		48 kHz
Equalizer	Band	3-band, Bass/treble Mid
	Turnover frequency	Bass: 125 Hz — 1 kHz Treble: 1 kHz — 8 kHz
	Center frequency	Mid: 54 — 8 kHz
	Level	±10 dB, 1 dB step
	Slope (Q)	3-step selectable, Wide, Mid, Narrow
Surround	ROOM SIZE	16-step adjustable
	WALL	16-step adjustable
	SEAT POSITION F/R	16-step adjustable
	SEAT POSITION L/R	16-step adjustable
	EFFECT LEVEL	20-step adjustable
	REVERB TIME	16-step adjustable
	DELAY TIME*3	15.0 ms-30. ms, 0.1 ms step
	REAR LEVEL	+10 — -50 dB, 1 dB step
	CENTER LEVEL*4	+10 — -50 dB, 1 dB step
	INPUT BALANCE	Automatic

*3 (only in the DOLBY mode)
*4 (only in the DOLBY, THEATER and LIVE modes)

FM tuner section

Frequency range		87.5 — 108.0 MHz
Antenna terminals		75 ohms, unbalanced
Sensitivity at 50 dB		18.3 dBf, 4.5 µV (mono) 38.3 dBf, 45 µV (stereo)
Usable sensitivity		11.2 dBf, 2 µV (IHF)
S/N	Mono	80 dB
	Stereo	74 dB
Harmonic distortion at 1 kHz	Mono	0.3 %
	Stereo	0.5 %
IM distortion	Mono	0.3 %
	Stereo	0.5 %
Separation		45 dB at 1 kHz
Frequency response		30 Hz — 15 kHz $^{+0}_{-2}$ dB
Selectivity		60 dB at 400 kHz
Capture ratio		1.2 dB
AM suppression ratio		54 dB
Image response ratio		70 dB
IF response ratio		70 dB
Spurious response ratio		80 dB
RF intermodulation at 800 kHz		60 dB
Auto tuning threshold	Low	30 dBf
	High	50 dBf

AM tuner section

Frequency range	530 — 1710 kHz (with 10 kHz interval) 531 — 1710 kHz (with 9 kHz interval)
Antenna	Loop antenna
Usable sensitivity	50 dB/m (at 1,000 kHz or 999 kHz)
S/N	54 dB (at 50 mV/m)
Harmonic distortion	0.5% (50 mV/m, 400 Hz)
Selectivity	35 dB (9 kHz), 40 dB (10 kHz)
Auto tuning threshold	55 dB/m

Video section

Inputs	VIDEO 1,2,3: 1 Vp-p 75 ohms
Outputs	VIDEO 1, MONITOR: 1 Vp-p 75 ohms

General

		STR-D2090	STR-D1090
System	Tuner section	PLL quartz-locked digital synthesizer system	
	Preamplifier section	Low-noise NF type equalizer	
	Power amplifier section	Pure-complimentary SEPP	
Power requirements		120 V AC,60 Hz	
Power consumption		USA model: 260 watts Canada model: 320 VA	
AC outlets		Two switched, total 120 watts	
Dimensions (including projecting parts and controls)		Approx. 430 x 148 x 385 mm (17 x 5 $^{13}/_{16}$ x 15 $^{3}/_{16}$ inches)	
Weight		Approx. 13.6 kg (30 lb)	Approx. 13.2 kg (29 lb 1 oz)

Supplied accessories

FM wire antenna (1)
AM loop antenna (1)
Remote commander
RM-P321(STR-D2090) (1)
RM-U221(STR-D1090) (1)
Sony Batteries SUM-3(NS) (2)

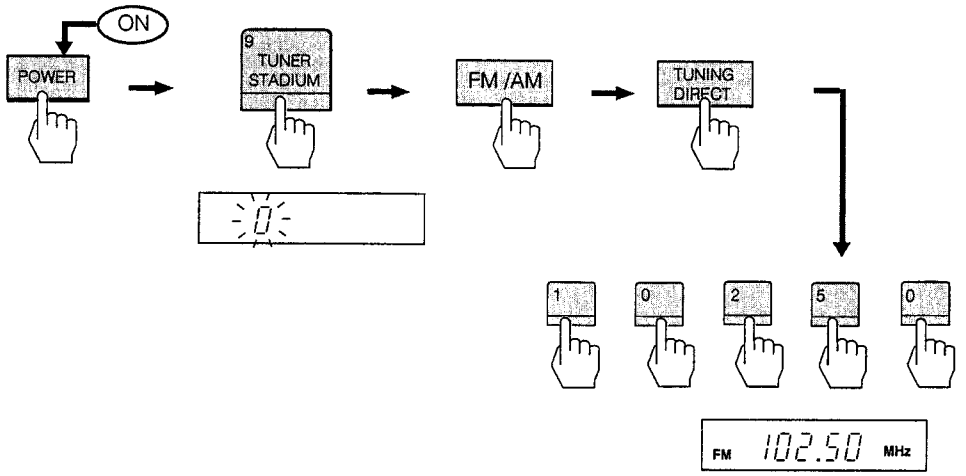
Design and specifications are subject to change without notice.

Quick Reference

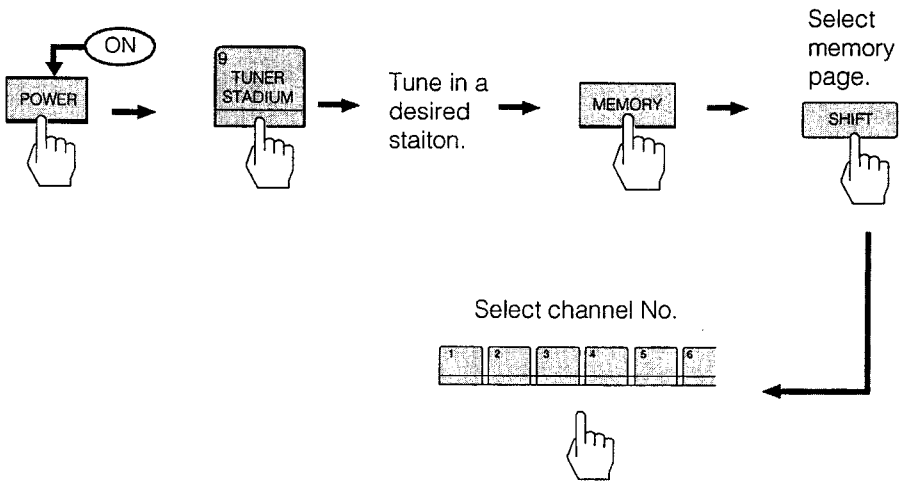
When operate the unit consulting this Quick Reference, make sure that the unit and the various audio/video equipment are properly connected.

Directly tuning in an FM or AM station

Ex. Tuning in the FM station of 102.50 MHz

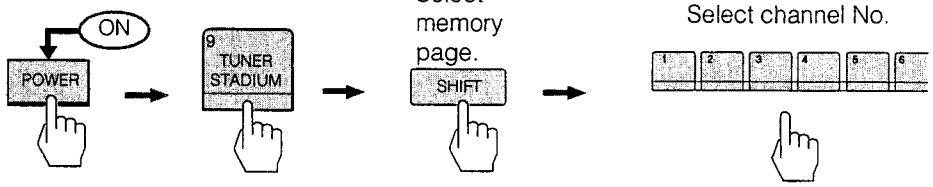


Presetting stations

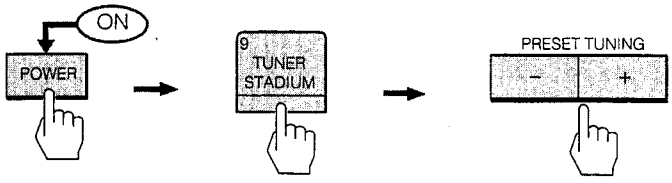


Tuning in a preset station

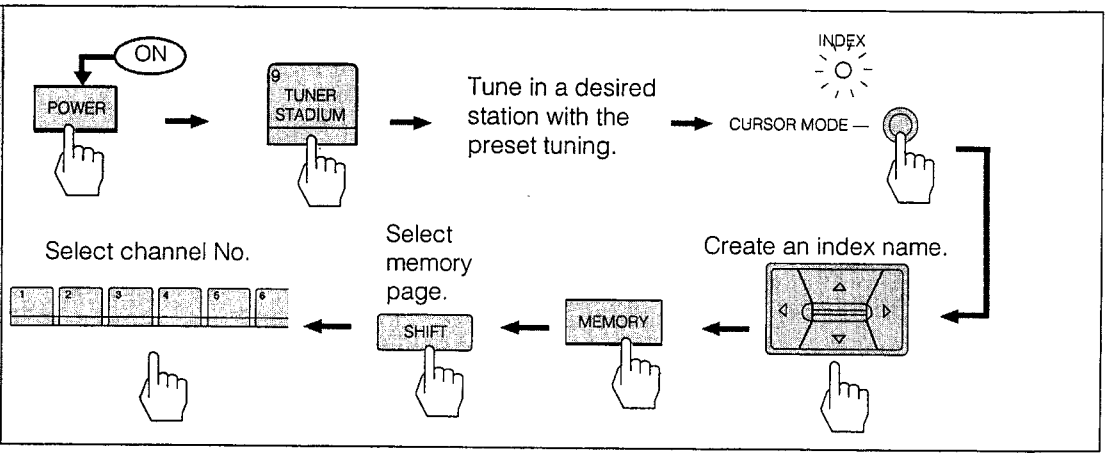
Method A: Direct tuning



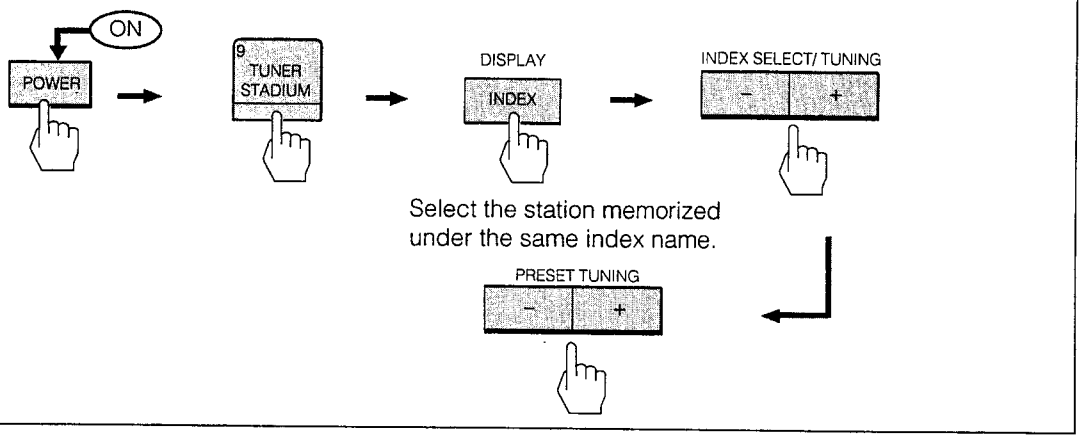
Method B: Scan tuning



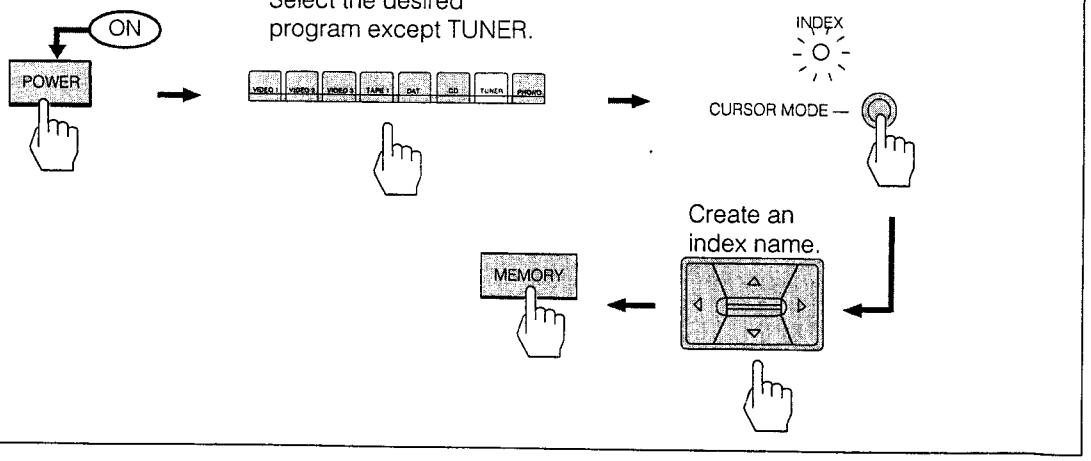
Labeling the preset stations



Selecting a station among the preset stations in the index

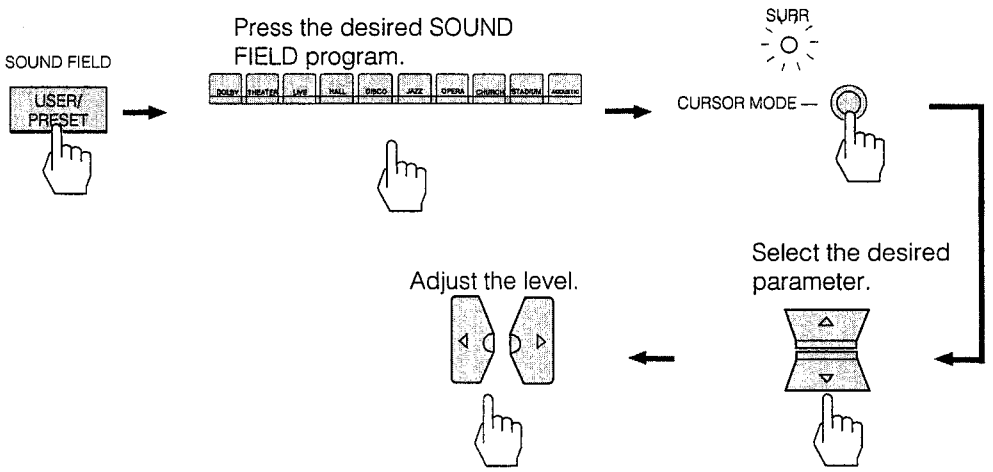


Labeling the program sources

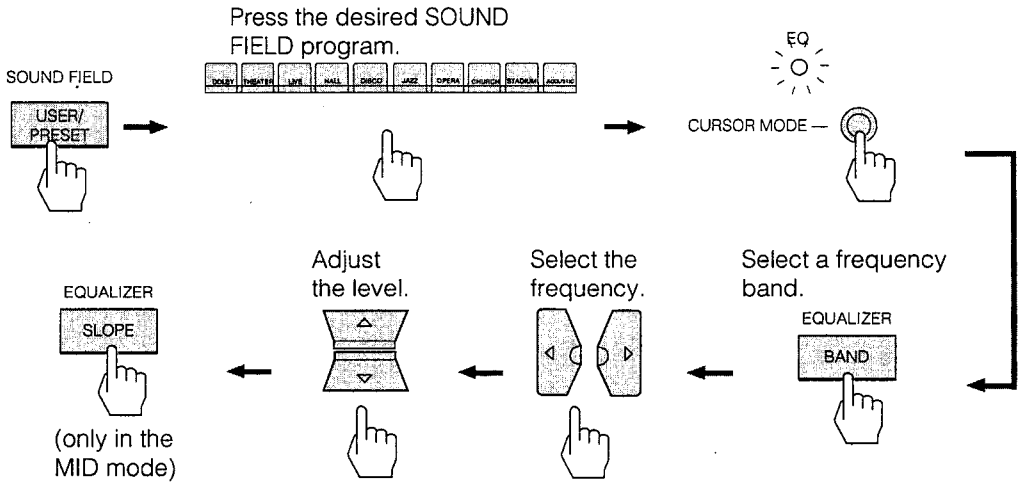


Quick Reference

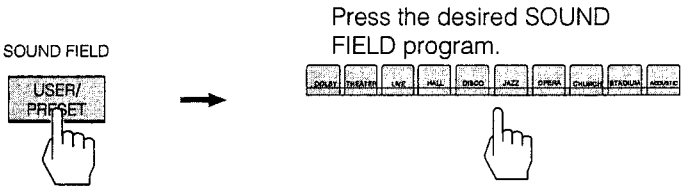
Adjusting the surround effect



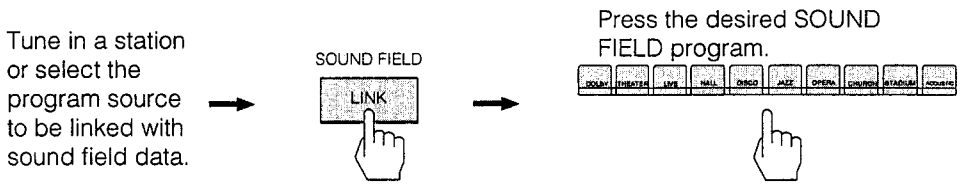
Adjusting the digital parametric equalizer



Calling up the sound field setting

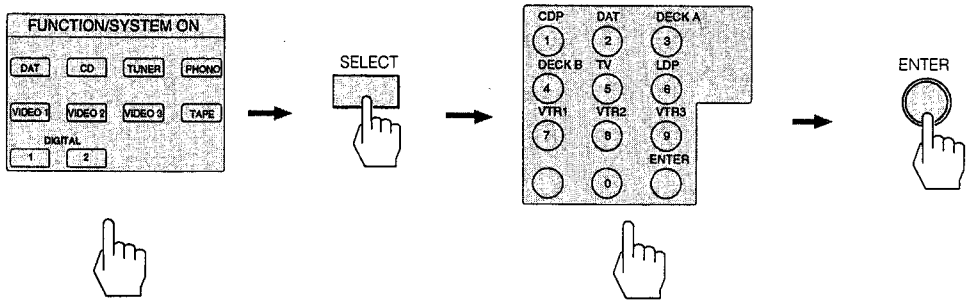


Linking the sound field memory to preset stations or program source


Tune in a station or select the program source to be linked with sound field data.
SOUND FIELD
LINK
Press the desired SOUND FIELD program.

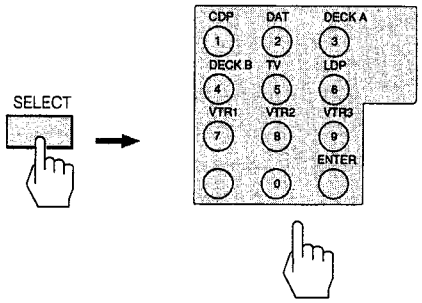
Remote Commander Operations

To change the settings of FUNCTION



Press a number (1 to 9).

To operate other unit temporarily without changing the settings of FUNCTION



Press a number (1 to 9).

Press the desired button to operate other unit.